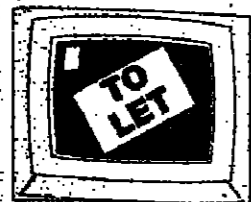


FINANCIAL TIMES

World Business Newspaper <http://www.ft.com>

WEDNESDAY DECEMBER 2 1998



Software outsourcing
Why not rent a friendly manager?
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Rhone-Poulenc
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The euro
UK will join but at wrong time
Martin Wolf, Page 16

Today's surveys
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Separate sections

WORLD NEWS

Britain gives pledge of compensation to Holocaust victims

The British government told the international conference on Holocaust assets in Washington that it would repay hundreds of Holocaust victims. Their property was confiscated by the UK during the second world war because their countries were held to be allied with the Nazis. Holocaust assets, Page 3

Wider impeachment probe attacked
The White House attacked Republican moves to broaden the impeachment inquiry into US president Bill Clinton, dismissing the investigation as increasingly partisan and misguided. US and Canadian news, Page 5

Jiang's state visit backfires
China made clear its frustration and anger over Tokyo's conduct during President Jiang Zemin's visit to Japan in a sign that the meeting failed to foster understanding between the two countries. Asia-Pacific news, Page 4

Call for shift in EU spending
The European Commission is expected to call on European Union countries to restructure government expenditure in favour of investment. European news, Page 2

Sharif to meet Clinton
Pakistan prime minister Nawaz Sharif is to meet US president Bill Clinton today in Washington, hoping for US backing to deal with his country's falling foreign exchange reserves and increasing arrears on foreign debts. Asia-Pacific news, Page 4

US to increase Colombia drug aid
The US reiterated its commitment to step up military aid to Colombia to fight the war against drugs. US and Canadian news, Page 5

Study backs breast implants
A court-appointed panel of scientific experts in the US concluded that there was no proven link between silicone breast implants and the diseases reported by women suing breast implant manufacturers. US and Canadian news, Page 5

Court to rule on disasters
London's High Court will today consider whether employees tainted by corporate disasters can sue their former employers when the stigma stops them getting a new job. The move follows the collapse of Bank of Credit and Commerce International. UK news, Page 8

Asian nations urged to spend
Asian governments must increase social spending to avoid exacerbating the social fall-out from the regional financial crisis, the International Labour Organisation warned. Asia-Pacific news, Page 4

IMF accepts Thailand deficit
Thailand plans to run a government deficit of 6.5 per cent of gross domestic product next year with the blessing of the International Monetary Fund. Asia-Pacific news, Page 4

Warning on southern Africa trade
US commerce secretary William Daley warned southern Africa that increased foreign investment depended on the abolition of trade barriers within the region and the creation of bigger markets. World trade news, Page 7

18 die in mine gas blast
A gas explosion in a coal mine in south-west China killed 38 miners and seriously injured 18.

BUSINESS NEWS

France forced to accept merger of BAe and Dasa

The French government has dropped its hostility to a merger between British Aerospace and Germany's DaimlerChrysler Aerospace (Dasa) that would initially exclude Aerospatiale of France. France had been pushing for a bilateral merger as the best way to achieve consolidation of Europe's aircraft and defence industry. Page 18; Paris, Bonn push EU finance deal, Page 2

Four international companies are to pay FF450m (\$79m) each for 7.5 per cent stakes in Thomson Multimedia, in a deal that will see 30 per cent of the French consumer electronics group's capital transferred to private hands. European companies, Page 24

Degussa, the German metals and chemicals group, reported record earnings for the fourth successive year and said it expected good results in 1999. European companies, Page 24

Coffey, a market-making company on the Amsterdam bourse, has had its operations suspended and an options dealer arrested. European companies, Page 24

Rhone-Poulenc of Germany and Rhone-Poulenc of France have agreed to merge their pharmaceutical and agro-chemical businesses to create the world's biggest life sciences company. Companies and Markets, Page 19; Observer, Page 17; Lex, Page 18; Analysis, Page 24

Nomura International, the Japanese investment bank, is to put most of its UK pubs into a new company that will seek a stock market quote in the next three years. The flotation is expected to value the company at £1bn (\$1.65bn). Companies and Markets, Page 19; New breed of brewers, Page 26

Losses at the international operations of CNBC, the television news channel specialising in financial markets, are likely to continue for longer than projected. Companies and Markets, Page 19; Dow builds on its strengths, Page 21

Ford, the US car and truck maker, said it aimed to corner 10 per cent of car sales in the Asia Pacific region within 10 years by expanding sales in China, Japan, Thailand and India. Asia-Pacific companies, Page 20

Statol, the Norwegian state oil company, is closer to pulling out of Thailand after selling its offshore Bontok field interests in a deal understood to be worth several hundred million dollars. Trade, Page 7

Countries that restrict foreign competition on their banking and capital markets are vulnerable to financial instability, according to a study by the World Trade Organisation. Trade, Page 9, Europe Page 7

Telecom Italia has asked its chief executive to complete as soon as possible negotiations over the company's plans to participate in a new digital pay TV system. European companies, Page 24

World Equity Markets

The latest trends and data from more than 50 national markets at a glance
Page 26

Exxon and Mobil agree world's biggest merger deal

By Robert Cordani in London

A wave of consolidation and restructuring looks set to engulf the western world's oil industry as US and European companies yesterday announced separate deals that will intensify competition in a sector beset by low prices.

In New York, Exxon announced an agreed takeover of Mobil, valued at \$75.3bn based on early afternoon share prices, in the world's biggest merger. The combined entity will be known as Exxon Mobil and will be the world's largest company in revenues terms.

In Europe, Total of France confirmed it is to take over PetroFina of Belgium in a deal that will create the world's sixth biggest oil company, and Europe's third biggest, with a market capitalisation of almost \$40bn. The two moves are the latest response to the twin threats of low crude prices and a downturn in demand, especially in Asia.

They follow British Petroleum's takeover last August of Amoco of the US. Analysts said they could trigger further restructuring.

Even if antitrust regulators force some divestments, with a current market capitalisation of more than \$240bn, compared with

World oil prices fall sharply as stocks grow

World oil prices are less than half their level of a year ago as stocks continue to outstrip supplies. Benchmark crude fell sharply again in London yesterday, hitting \$10.05 a barrel at one stage, its lowest since 1986. The price has been trading at 12-year lows since the middle of last week, when Opec postponed a decision on production cuts. In late trading yesterday the price was down 14 cents to \$10.32. Page 30

former leader Royal Dutch/Shell's \$160bn-plus, Exxon Mobil will tower over its competitors.

But the companies insisted that regulatory concerns may be overblown. The deal, revealed in the Financial Times last week, will set new standards for an industry which has been slow to follow the merger trend.

Lee Raymond, Exxon's chairman, who will lead the new company, and Mobil's Lucio Noto, who will be his deputy, said they expected near-term cost-savings of \$2.8bn. Mr Raymond said he saw the deal resulting in 9,000 jobs lost from a combined total of

Top 10 global oil companies, measured by 1997 revenues

Exxon Corp, \$182.4bn
Royal Dutch/Shell, \$128.1bn
BP Amoco plc, \$104bn
Total, \$46.6bn, to reflect acquisition of PetroFina
Texaco, \$45.2bn
Elf Aquitaine, \$43.5bn
ENI, \$37bn
Chevron Corp, \$36.4bn
Petrobras de Venezuela SA, \$34.8bn
Conoco Inc, \$26.2bn, as if spun off from parent DuPont Co.

123,000. The two companies said the link-up would boost their competitiveness and ability to produce superior returns. "The merger will enhance our ability to be an effective global competitor in a volatile world economy and in an industry that is more and more competitive," the chairman said in a prepared statement.

The companies will control or supply almost 50,000 service stations between them. Last year they sold almost 9m barrels of petroleum products daily and had interests in 50 refineries. They earned about \$12bn on

aggregate revenues of \$203bn. The smaller Total PetroFina deal is significant in that it suggests national sensitivities about the fate of former state oil companies in Europe are receding.

Based on Friday's Total share price, its offer valued PetroFina at BF19,483 per share, valuing the whole group at BF745bn (\$12.97bn). That was a 36.7 per cent premium to Friday's closing PetroFina share price of BF14,250, and above analysts' estimates of a BF18,000-a-share offer on Monday.

The French company's shares slid FF87, or 12.3 per cent, to FF18 on the weak Paris market amid suggestions that the group had overpaid.

The combined group, to be called Total Fina, will have 69,000 employees, 14,000 filling stations, reserves of 5.7bn barrels of oil equivalent, and annual sales of \$4bn.

Exxon is advised by J.P. Morgan, Mobil by Goldman Sachs. J.P. Morgan and Paribas are advising PetroFina, with CSFB advising Total.

Additional reporting by Christopher Parkes in Los Angeles

Bigger oil, Page 17
Lex, Page 18
Reports and analysis, Page 22



French premier Lionel Jospin, left, president Jacques Chirac, centre, and German chancellor Gerhard Schröder at the Franco-German summit yesterday

Majority tax voting idea stirs EU debate

By Peter Norman in Brussels

France and Germany yesterday floated the idea of majority voting in tax policy in the European Union, opening up fresh divisions ahead of the launch of the single currency.

The implicit threat to overturn the rules of unanimity on tax policy - raised in separate statements by Oskar Lafontaine, Germany's finance minister, and Dominique Strauss-Kahn, his French colleague - put both countries on a collision course with Britain.

Gordon Brown, UK chancellor of the exchequer, said at a meeting of EU finance ministers in Brussels that majority voting on tax matters would require a change in the EU treaty that itself would require unanimity. "That is simply not there," he said. Britain said it was not isolated on the issue, with Sweden and Luxembourg also opposed to majority voting on tax.

The Ecofin meeting in Brussels considered EU efforts to combat unfair practices in business taxation and touched on a commission plan for a 20 per cent withholding tax on savings.

Mr Lafontaine and Mr Strauss-Kahn floated the idea of majority voting during breaks in the meeting, but they stressed that they were expressing "personal opinions" rather than government policy.

However, the apparent co-ordination between French and German positions raised the suspi-

cion that the two ministers were retaliating to Mr Brown's threat last week to use the national veto to block any tax measure hostile to British interests.

Other remarks from Mr Brown and Mr Lafontaine underlined growing differences over EU taxation policy between Britain and the new left-of-centre coalition in Bonn. While Mr Lafontaine repeated Germany's determination to seek progress towards minimum taxation of companies and savings during Bonn's six-month presidency of the EU starting in January, Mr Brown emphasised Britain's commitment to economic reform and liberalised capital markets.

Separately, a move by the German government, backed by France and tacitly supported by Britain, to delay the phasing out of duty free sales for travellers within the EU on July 1 1999, founded when six member states insisted intra-EU duty free sales should cease as planned.

Ministers did, however, agree on how the 11-member euro-zone should be represented in international institutions such as the Group of Seven leading industrial countries after the start of the single currency on January 1. In a setback for the EU commission, which wanted equal status with ministers and the European central bank, the ministers said the representative should be the rotating chairman of the euro 11.

France-German summit, Page 2
Editorial comment, Page 17

Markets tumble as investors take profits

By Philip Coggan, Markets Editor

European and Asian stock markets tumbled yesterday as worries about the outlook for economic growth combined with the urge to take profits after the breakneck rally seen since early October.

In Europe, the DAX index of leading stocks in Frankfurt fell nearly 5 per cent, and the FTSE 100 index in London suffered its third biggest one-day points fall and fifth biggest percentage decline. In Hong Kong, the Hang Seng index fell 4 per cent to close below 10,000.

The first economic data of the new month showed that manufacturing industries around the globe continued to be under pressure. Purchasing managers' surveys in five European countries all indicated declining activity in the sector, as did a similar report in the US.

"It has been a bad day for European growth optimism," said Ian Harnett, director of European strategy at BT Alex Brown. "What is clear is that the consensus expectation of over 2 per cent GDP growth for Europe in 1999 looks at risk, and even our previous projections of 1.5 to 2 per cent may be too high. The implication is that corporate earnings numbers have still got further disappointments to come."

The poor economic news came in the wake of Wall Street's sharp fall on Monday, which saw the Dow Jones Industrial Average drop 216 points on a wave of selling of internet stocks.

Wall Street's weakness continued in early trading yesterday, when the Dow briefly fell more than 100 points before recovering to 8128.14, up 11.58, by lunchtime in New York.

By the end of last week, the German and French markets had each risen by a third from their October lows, while the UK and the US markets had gained between 20 and 25 per cent.

The rally was initially fuelled by interest rate cuts in the US and Europe, but has recently been propelled by the wave of mergers and acquisitions. However, even yesterday's announcement of the Exxon/Mobil and Total/PetroFina deals, failed to improve investors' mood.

London stock exchange, Page 36
World stock markets, Page 40

WORLD MARKETS

STOCK MARKET INDEXES		
New York: Dow Jones	8,108.82	(-7.72)
Dow Jones Ind Av	1,570.7	(-21.18)
NASDAQ Composite	1,570.7	(-21.18)
Europe and Far East		
CEAX	3,880.34	(-115.04)
DAI	4,781.73	(-345.97)
FTSE 100	5,537.5	(-126.4)
Nikkei	14,535.41	(-415.25)
US LIQUIDITY RATES		
Federal Funds	4.875%	
3-mth (from 11/1/98)	4.50%	
Long Bond	5.000%	
OTHER RATES		
UK 3-mth bank rate	5.0%	
UK 10 yr Gilt	134.17	(135.64)
France 10 yr OAT	138.22	(138.18)
Germany 10 yr Bund	106.30	(106.48)
Japan 10 yr JGB	105.94	(106.48)
ASSETO GEA CH (Avg)	50.805	(50.87)

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Full contents and Lex back page			



Time for a change of direction?

Creative Capital for Management Buy-Outs

Many companies reach a point where the management team decide it would be better to follow their own vision, rather than their leader's.

And whether that involves a complete change of direction, or just a different style of management, the ideal partner to help realise the new vision is Philidrew Ventures.

We generally look at M&Bs or MBOs between £20 million and £200 million.

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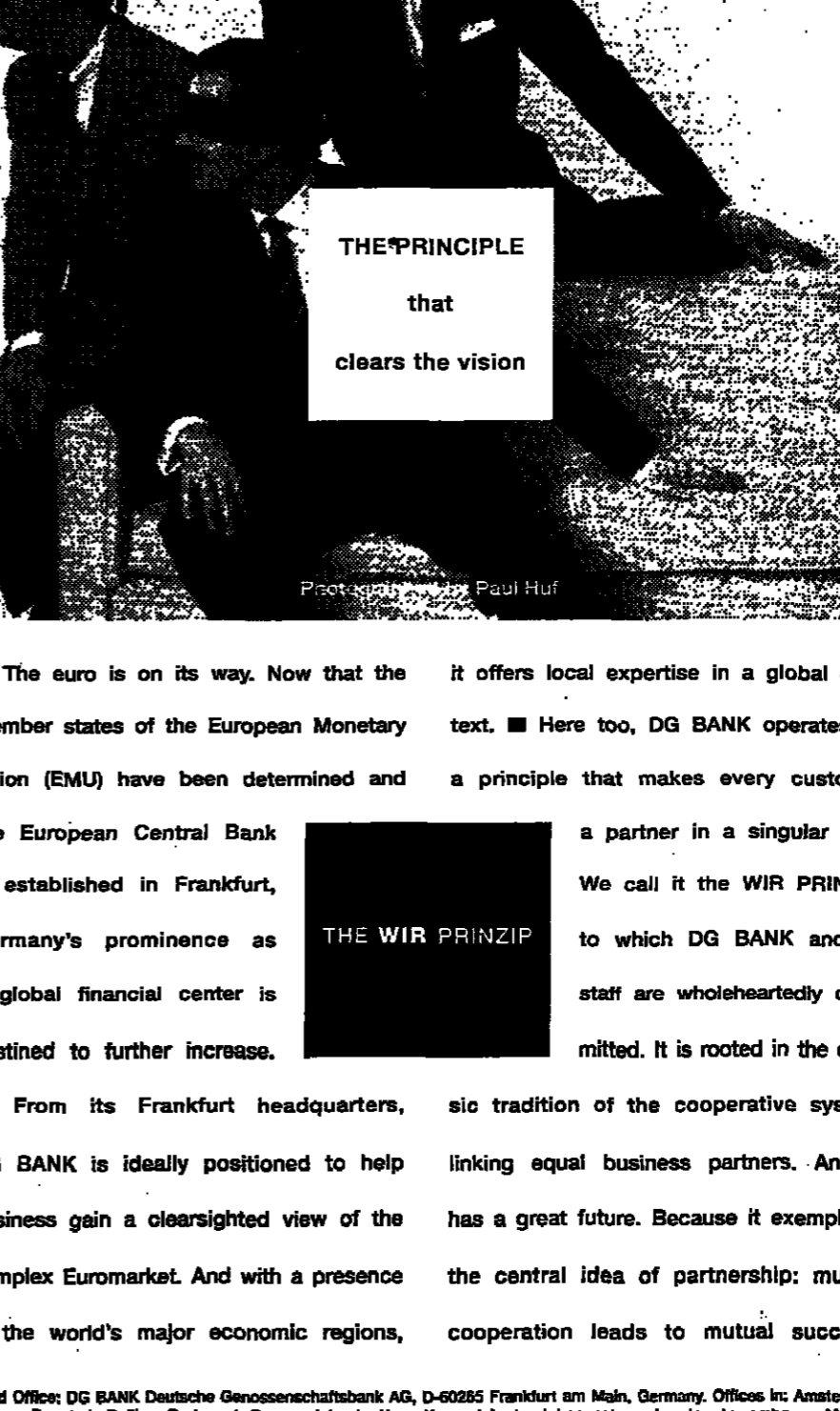
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Assurance from UK on repayment

US to reveal details of traffickers

French bankers to support government's plans

Furthermore, any new list of dormant assets will have to be offset against assets returned as part of a government initiative launched in 1944. Mr Jospin also pledged FF£50m of public funds for the enlargement of an existing memorial to Jewish martyrs.



Bates Germany

THE PRINCIPLE
that
clears the vision

Photograph by Paul Huf

■ The euro is on its way. Now that the member states of the European Monetary Union (EMU) have been determined and the European Central Bank is established in Frankfurt, Germany's prominence as a global financial center is destined to further increase.


THE WIR PRINZIP

■ From its Frankfurt headquarters, DG BANK is ideally positioned to help business gain a clear-sighted view of the complex Euromarket. And with a presence in the world's major economic regions,

it offers local expertise in a global context. ■ Here too, DG BANK operates by a principle that makes every customer a partner in a singular way. We call it the WIR PRINZIP, to which DG BANK and its staff are wholeheartedly committed. It is rooted in the clas-

sic tradition of the cooperative system linking equal business partners. And it has a great future. Because it exemplifies the central idea of partnership: mutual cooperation leads to mutual success.

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DG BANK 

Chilean trial for Pinochet 'not possible'

By Imogen Mark in Santiago, Andrew Parker in London and David White in Madrid

Politicians from the Socialist party of José Miguel Insulza, the Chilean foreign minister, have written to Jack Straw, UK home secretary, insisting that General Augusto Pinochet could not be brought to justice in Chile.

Listing a series of judicial and political obstacles which would, they say, have to be removed in order to resolve the issue, the politicians have taken an opposite line to that of Mr Insulza, who is in Europe trying to prevent the former dictator's extradition from the UK to Spain on charges of genocide, terrorism and torture.

The Socialists have urged a limit to the scope of the military courts (which routinely take over jurisdiction

in a case in which the military are involved), and repeal of an amnesty which pardons all those involved in political crimes committed between 1973 and 1980.

Mr Straw has until December 11 to decide whether to authorise extradition proceedings. Gen Pinochet was arrested on October 16.

Mr Insulza said yesterday his talks in London and Madrid had produced "some positive signs" about a solution to the case. But he refused to say what these were, and made clear he had received "no commitment from anybody".

After meeting his Spanish counterpart, Abel Matutes, he raised the prospect of a trial in Chile if Gen Pinochet's immunity as a member of the Senate was lifted. But he said the Chilean government was under no obli-



Straw: to decide on extradition



Pinochet left hospital

gation to promise a trial.

Gen Pinochet was last night reported to have left the UK hospital he stayed in while fighting extradition to Spain, for a house in south London. London's Grove-lands Priory hospital said it had asked him to leave because he had recovered from back surgery.

Michael Caplan, Gen Pinochet's lawyer, said he was "distressed" about the hospital's decision to say publicly it wanted him to leave. "The senator has always been anxious to move from the hospital as soon as possible,"

An opinion poll in yesterday's London Evening Standard found that 51 per cent of those questioned wanted Gen Pinochet to be extradited to Spain. Only 32 per cent wanted him to be allowed to return to Chile.

Madeleine Albright, US secretary of state, said this week that consideration should be given to Chile's fledgling democracy. Despite this, the UK government insisted Mrs Albright had not asked for Gen Pinochet to be allowed to return to Chile during a telephone conversation with Robin Cook, UK foreign secretary, on November 21.

Quebec voters plump for more of the same

By Edward Alden in Toronto

The provincial election in Quebec on Monday had been billed as an historic battle that would go a long way to resolving the lingering question of Quebec's place in Canada.

But after all the sound and fury, it resolved nothing, which appears to be exactly what Quebec voters wanted. It opens the door to the one choice, the only choice, almost all Quebecers can agree on: a permanent campaign to extract from Ottawa ever more powers for the Quebec government by holding out the ultimate threat of separation.

Premier Lucien Bouchard, who heads the separatist Parti Québécois, was returned with a safe majority, winning 75 of the 125 seats in the provincial legislature. But the PQ lost two percentage points in the popular vote from its 1994 victory, finishing with just 43 per cent support.

Jean Charest, former federal Conservative leader who had been touted as the last, best hope for a pro-Canada government in Quebec, did little better than his predecessor Daniel Johnson.

After enjoying a big lead over Mr Bouchard earlier this year, Mr Charest won only 46 seats, one more than in 1994, and saw the party's popular vote drop nearly one percentage point to 44 per cent. But he avoided the humiliating defeat polls had predicted.

The only obvious winner was third party candidate Mario Dumont, a former Liberal who heads the fiscally conservative Action Démocratique. His party jumped from 7 per cent to 12 per cent of the popular vote, though it again won only one seat.

The ambiguous outcome leaves Mr Bouchard's next moves very much in doubt. In his acceptance speech, he said, in French, that he had a mandate "to create the winning conditions for a referendum", implying that he plans to hold another vote on separation from Canada.

But, in English, Mr Bouchard said to voters he recognised "the signal you send by choosing candidates who reflect your attachment to Canada".

With some 58 per cent of Quebecers opposing a switch in sovereignty, and two-thirds saying they do not want another referendum, it will be difficult for Mr Bouchard to call a vote on separation soon.

That leaves a stalemate. The rest of Canada is unwilling to amend the constitution to give Quebec special powers within the confederation. Quebecers, while unhappy with the status quo, are unwilling to vote their way out of Canada.

The next act is expected to be negotiations on a so-called "social union". All 10 provinces, Quebec included, have long been upset by Ottawa's ability to use its spending power to launch its own programmes in areas of provincial jurisdiction such as health, education and welfare. The provinces have agreed to press Ottawa for a new funding formula allowing them to opt out of federal programmes with financial compensation in areas under provincial jurisdiction.

After initially refusing to participate in the discussions, Mr Bouchard said in the campaign he would join the talks, even insisting on a February deadline for Ottawa to accept the proposal.

If Ottawa accepts, Quebec will opt out and gain more powers and more federal tax dollars; if Ottawa refuses, Mr Bouchard can insist sovereignty is the only viable alternative.

Mr Charest insists the talks will force the premier to shed the ambiguity that served him well but, with Quebec voters once again boldly asserting their own ambivalence, it is hard to imagine a clear answer emerging soon.

NEWS DIGEST

IMPEACHMENT HEARINGS

White House attacks plans to broaden inquiry

The White House yesterday attacked Republican moves to broaden the impeachment inquiry into President Bill Clinton, dismissing the investigation as increasingly partisan and misguided.

Joe Lockhart, the president's press secretary, said the decision by the House judiciary committee to examine allegations of campaign fundraising abuses in the 1996 election was a desperate fishing expedition by extremist Republicans. However, Republicans insisted the move was justified. "We have information that we cannot ignore and the committee would be derelict in its duty if it did ignore them," a committee aide said.

The sniping comes as the impeachment issue moves towards a vote this month. Mark Suzman, Washington

US ECONOMY

Survey points to recovery

The US manufacturing sector slowed for the sixth straight month in November, but there are signs of a possible improvement in the economy by the middle of next year, according to two reports issued yesterday.

The National Association of Purchasing Management, which tracks the manufacturing sector through a survey of corporate purchasing executives, said new orders, exports and imports declined at many factories last month.

The trade group's index of economic activity was 48.8 per cent, down 1.5 points from October. A reading under 50 per cent is a sign of contraction in the industrial sector.

But The Conference Board, a private research group, reported its index of leading economic indicators rose 0.1 points in October, to 105.6. The gain followed two months of flat results. Agencies, New York and Washington

CUBAN IDEOLOGY

Christmas every year

Cuba's ruling Communist party has apparently decided that Santa Claus and the celebration of the birthday of Christ no longer represent a threat to the nation's ideological integrity.

In a statement published yesterday, the party's Politburo confirmed that Christmas was being permanently restored in Cuba after an absence of nearly three decades.

The move will make permanent the Christmas Day holiday provisionally granted last year by President Fidel Castro as an "exceptional" one-off goodwill gesture to honour Pope John Paul II, who visited the island in January.

But lest the restoration of Christmas give the impression that it was going soft, the Politburo declared that Cuba's revolution was "indestructible" and would continue to defy all attempts to destroy it. Pascal Fletcher, Havana

On the web today

- Anti-gun lobby may find it hard to hit target in court
- US to step up Colombia drugs aid
- Bishop's death leaves Guatemalans thinking there has been a cover-up

<http://www.ft.com/Americas>

PANEL INQUIRY STUDY IMPLIES BILLION-DOLLAR LAWSUITS ARE WITHOUT MERIT

Implants 'not linked to illness'

By Richard Tomkins in New York

A court-appointed panel of scientific experts yesterday concluded that there was no proven link between silicone breast implants and the diseases reported by women suing breast implant manufacturers.

The four-member National Science Panel, which reported its findings after studying the available evidence for two years, is the most authoritative body yet to have studied the evidence in the US.

Its findings imply that the billions of dollars' worth of claims against Dow Corning and other breast implant manufacturers are without merit. However, the report comes too late to affect settlements already reached by breast implant manufac-

urers - including Dow Corning's \$3.2bn settlement with lawyers representing 176,000 claimants last month.

The panel was formed in October 1996 by Judge Sam Pointer, the federal judge presiding over the Dow Corning case and other breast implant litigation.

Its task was to review the available evidence on the possibility of links between silicone breast implants and the diseases reported by women filing lawsuits.

Yesterday it unanimously reported that it could find no conclusive evidence of any such links in the four main areas it had studied - immunology, epidemiology, toxicology and rheumatology.

"The material presented represents an analysis of the most rigorous and relevant scientific information currently available," it said.

The panel's finding is in line with many other studies around the world, including one from a government-appointed independent review group in Britain earlier this year, which have found no evidence linking breast implants with disease.

Dow Corning called the report "good news for women and good news for Dow Corning", saying women had yet to vote on its offer of a \$3.2bn settlement.

But those involved in the breast implant litigation said the report proved nothing. Diana Zuckerman, a board member of the National Women's Health Network, said: "It is very careful not to say that breast implants get a clean bill of health."

Ms Zuckerman said the report covered only the diseases most frequently figuring in breast implant litigation - autoimmune responses and connective tissue diseases - ignoring the many other diseases of concern to women with implants.

In addition, Ms Zuckerman said, the report was not new research, but a review of existing research, so its findings were not a surprise.

Even so, the report is likely to prove influential in any further breast implant litigation because its findings can be used in court cases across the US. The panel's members are due to give videotaped, sworn statements that can be used in evidence.

The report is also likely to add to the controversy over the use of so-called junk science in US court cases, which has resulted in payouts of billions of dollars to settle claims based on flawed science.

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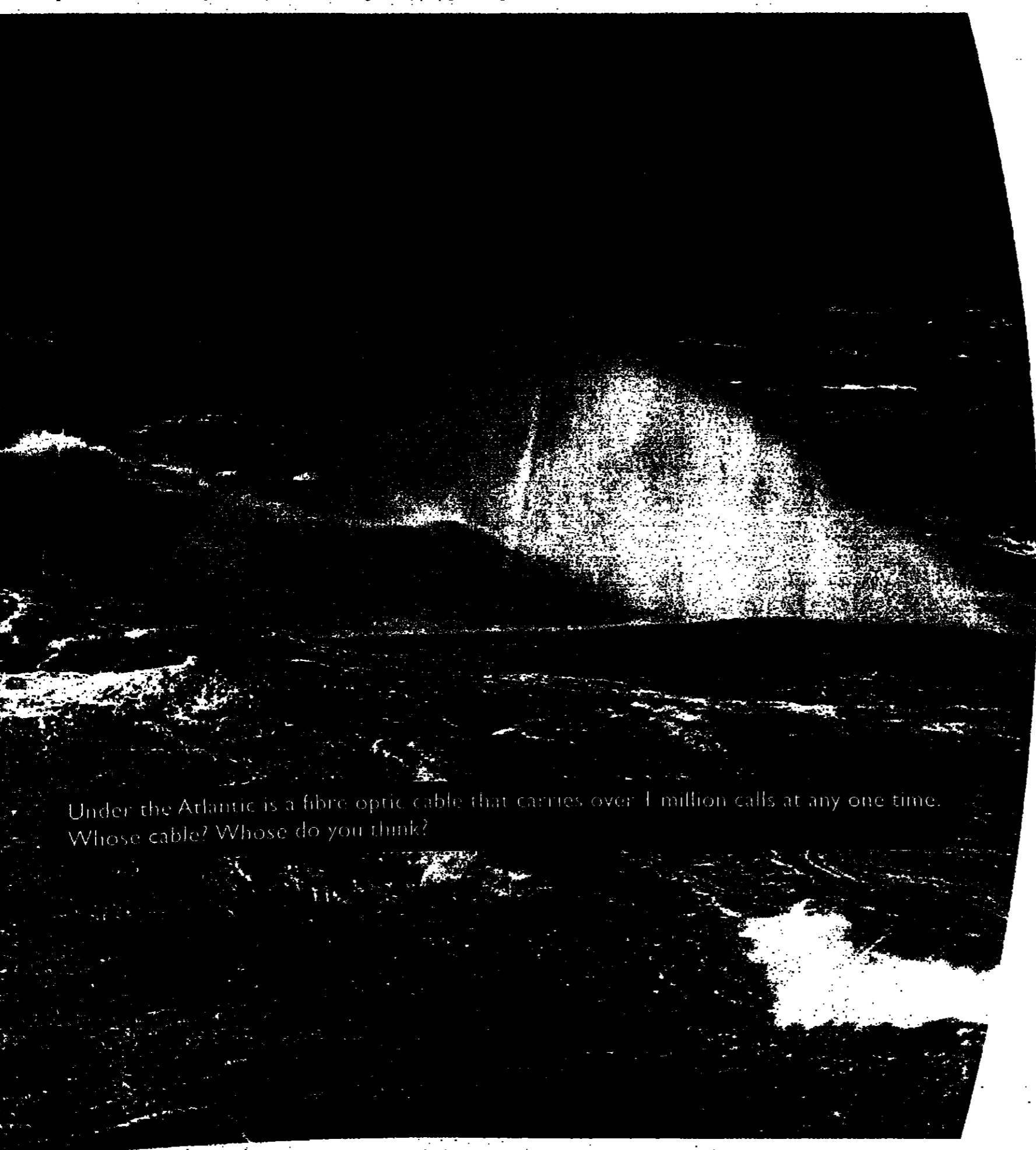
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In addition, Ms Zuckerman said, the report was not new research, but a review of existing research, so its findings were not a surprise.

Even so, the report is likely to prove influential in any further breast implant litigation because its findings can be used in court cases across the US. The panel's members are due to give videotaped, sworn statements that can be used in evidence.



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Liberalisation is good for stability, says WTO study

By Guy de Joux

Countries that severely restrict foreign competition in their banking and capital markets are highly vulnerable to financial instability, according to a study by World Trade Organisation researchers.

The study, based on an analysis of 27 developing economies, finds that those which have suffered from financial turmoil during the 1990s impose much tighter restrictions on trade in financial services than those that have avoided a crisis.

The findings challenge conventional wisdom in some troubled developing countries, where recent turbulence has induced caution towards further financial services liberalisation and, in the case of Malaysia, led to reimposition of capital controls.

The study says financial stability has been greatest in countries that have opened financial services to wide competition and permit foreign institutions to establish a commercial presence and operate freely in their markets.

The biggest benefits of liberalisation came from allowing foreign institutions to establish a local commercial presence - rather than just supply a limited number of services from abroad - because that did most to promote competition, efficiency, transparency and better information.

"If foreign service providers are allowed to supply a broad range of services, rather than only lending and deposit taking, they are likely to develop bond and stock markets or, in other words, financial market

broadening and deepening," the study says.

Equally important, countries that liberalised regulations on commercial presence did not need to remove all capital controls, because foreign institutions' local affiliates could fund many of their activities domestically.

The study finds that developing countries which committed themselves in last year's WTO financial services agreement to the most liberal policies towards foreign commercial presence have enjoyed the most stable foreign direct and portfolio investment flows.

However, policies that restricted international competition to the supply of financial services across borders increased the risk of financial instability by encouraging foreign institutions to focus on short-term business, which relied heavily on financing from abroad.

Based on an analysis of countries' commitments in the financial services agreement, due to take effect next year, the study finds Argentina, Ghana, the Czech Republic, Slovakia, Hungary and Morocco have the policies most likely to favour financial stability. Developing countries with policies most likely to produce financial volatility included Indonesia, Korea, Poland, Romania, Brazil and Venezuela.

Financial services trade, capital flows and financial stability. Staff working paper ERAD 98-12, Economic Research and Analysis Division, World Trade Organisation, rue de Lausanne 154, CH-1211 Geneva 21, Switzerland. Tel: (4122) 739 5111.

Editorial Comment, Page 17

TELECOMS LIBERALISATION TELEFONICA TO CHALLENGE 30% CUT IN INTERCONNECTION FEES AS MARKET CONTINUES TO OPEN UP

Debut for Spain's third fixed-line operator

By Tom Burns in Madrid

Spain yesterday took a big step in the liberalisation of its telecommunications sector. This came with the start-up of Unif2, a third fixed-line carrier - controlled by France Telecom - which will initially operate long distance calls.

Under the open market guidelines, more than 20 providers of niche telephony services have applied for

licences to the Telecommunications Market Commission (CMT), a newly created independent regulator, which will supervise the sector.

British Telecommunications, which already operates a data transmission company in Spain and is a main backer of Airtel, a second mobile phone carrier, is likely to add basic telephony services to its Spanish business early next year.

To encourage competition,

the CMT has lowered the reference price for the interconnection fees that new operators will negotiate for the use of lines owned by Telefonica, the former monopoly operator. The reduction of up to 30 per cent in existing fees came into operation yesterday, but Telefonica said it would contest this in court.

Unif2 will compete with Retevisión, a carrier launched by Telecom Italia in January as Spain's second

fixed-line provider, as well as with Telefonica. It plans to invest Ptas207bn (\$1.4bn) over the next 10 years in order to gain 7.5 per cent of the domestic market by 2008.

The new operator, which is 68 per cent owned by France Telecom, was the sole bidder in May for the third fixed-telephony licence awarded by the government in the run-up to deregulation. It was beaten by Retevisión in its attempt to

gain the third mobile licence, awarded in June.

The government plans to dispose of its 30 per cent stake in Retevisión through an industrial sale before year-end, and Retevisión will begin to offer cellphone services in January. Unif2 now hopes to enter Spain's cellular market using new mobile systems that have still to be approved by the European Union.

The Spanish telecom mar-

ket represents one of the brightest investment opportunities in the EU. There are some 40 telephones per 100 inhabitants against the European average of over 50 and the number of mobile phone users is forecast to grow from 4m to 10m over the next three years.

Airtel accounts for 30 per cent of domestic cellular business, and Retevisión has some 8 per cent of the long distance calls market.

US warns on southern Africa barriers

By Victor Mallet in Cape Town

William Daley, US commerce secretary, yesterday warned southern Africa that increased foreign investment depended on the abolition of trade barriers within the region and the creation of bigger and more attractive markets.

Mr Daley is touring the continent with US business executives and seeking to revive the administration's policy of promoting trade and investment with Africa.

A US official yesterday said President Bill Clinton remained committed to pas-

sage of the Africa Growth and Opportunity Act, aimed at increasing trade between the US and Africa. The legislation died in October when it became a lame duck.

"For Africa to be on a global stage, it cannot be small, disconnected markets. It must be regional markets," said Mr Daley. "In this part of the continent, companies want to look beyond the 40m people of South Africa."

He told a conference organised by the International Herald Tribune. "They want to look to the 150m people of the SADC [Southern African

Development Community] region. So, I believe you need to reduce the trade barriers with your neighbours."

Mr Daley noted that intra-African commerce, at 13 per cent of total African trade, remained exceptionally low, and he criticised the slow pace of trade liberalisation following an agreement two years ago to make the 14-nation SADC a free trade zone by 2004.

Businessmen and government officials from Botswana, one of South Africa's neighbours, suggested that South African protectionism was an obstacle to the free

flow of trade. Don Knauss, president of Coca-Cola Southern Africa, said his company was confident it could double its business in the region by 2003, but he complained about South Africa's costly subsidies for its sugar farmers.

Alec Erwin, South African trade and industry minister, retorted that his country had the lowest average tariffs in the region and agreed that a more unified regional market was vital.

Mr Daley did not just insist on the need for regional economic integration. He also said potential

investors would be put off by corruption, political instability and lack of intellectual property protection. The latter was a reminder of protests by the US pharmaceutical industry about South African government purchases of cheap generic drugs.

"The fighting in the Congo - the waste of such great human and resource potential - sends the picture to the world of the old Africa, not the new Africa," Mr Daley said. "You and I know that business people don't want to buy into the old Africa."

NEWS DIGEST

NORWEGIAN OIL AND GAS INTERESTS

Statoil begins disposal of stakes in Asian assets

Statoil, the Norwegian state oil company, is closer to pulling out of Thailand after selling its offshore Bangkok field interests in a deal understood to be worth several hundred million dollars.

The company said yesterday it sold a 10 per cent stake in the 5,000bn cubic feet gas field to its licence partners: Petroleum Authority of Thailand (PTT), the state oil company, Total, the French oil company, and British Gas of the UK. The three partners hold 40 per cent, 30 per cent and 20 per cent respectively.

The deal marks the first and largest of three planned Statoil sell-offs in the region to concentrate on other international areas. The company's international activities will focus on the 4bn barrel oil fields in Azerbaijan and the deepwater finds in offshore Angola, as well as Vietnam, the UK, the Gulf of Mexico and Brazil, said Johan Nic Vold, executive vice-president of Statoil.

Statoil expects to conclude shortly the sale of its 45 per cent stake in the 500bn cubic feet gas field in offshore Thailand and its 20 per cent share in deepwater exploration blocks in the Andaman Sea, west of Thailand. Unocal Petroleum and Mitsui Oil Exploration own the remaining 65 per cent in the offshore block, while Unocal and Total hold a 46.7 per cent and 33.3 per cent stake in the Andaman sea blocks.

Statoil also plans by the end of this year to pull out formally from the Namibian shelf, where it holds a share in an exploration licence in south-west Africa. Statoil has drilled three dry wells there, together with Saga Petroleum and Norsk Hydro, the two other Norwegian oil companies.

Vester Skjold, Oslo

SEA TRANSPORT

First containers at Omani port

The southern Omani port of Raysut, 1,000km south of Muscat, yesterday began commercial operations with the arrival of two container ships owned by Sealand of the US and Maersk of Denmark.

Both companies have a 15 per cent interest in the new port's management company, Sealah Port Services. Between them they operate about a third of the container fleet in the region.

The \$260m container terminal expects about 26 ships to dock there this month and plans to target traffic to the Indian sub-continent, east Africa and the Middle East. Maurice Gent, London

INDIAN TRADE

High tariffs come under fire

India is at risk of hampering exports and raising domestic prices because of its high import tariffs, which are among the highest in the world, the World Trade Organisation's deputy director-general, Anwarul Hoda, said yesterday.

Although he praised the liberalisation of India's trade and industrial policy over the past decade, he said there was still some distance to go.

Mr Hoda compared Indian tariff levels for five categories of industrial goods with those of selected developing and industrialised countries to paint a picture of tariff protection in India. In industrial products the simple average tariff for India was 35 per cent, almost three times that of Argentina and Brazil, and more than six times that of the European Union and the US. He said the percentage of European Union duties above 35 per cent was almost 40 tariff lines having duties above 35 per cent for other countries for India against zero to two for other countries.

The figures used were based on tariffs prevailing before India's 1998-99 budget, which introduced a special extra customs duty of 4 per cent. International Staff

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BRITAIN

INDEPENDENCE 'DANGEROUS' IDEAS FOR EMBASSIES SCORNE

Minister warns of Scottish 'delusions'

By James Buxton in Edinburgh

Anyone who believed Scotland would benefit by cutting itself out of the UK's diplomatic and trade assistance network was "seriously and dangerously deluded", Brian Wilson, the trade minister, said last night.

His comments came in a powerful attack on the Scottish National party and its hope for Scottish independence. Mr Wilson, a former minister for Scottish industry, said the UK's trade promotion network was the widest and most effective in the world.

"What possible benefit could there be to Scotland in tearing that arrangement asunder in order to have the

satisfaction of opening a Scottish embassy in a Tokyo side street?" he said.

But Alasdair Morgan, SNP enterprise spokesman, countered by publishing letters from the British and Irish Republic embassies in Vienna in response to an SNP supporter's request for information. "The British embassy is streets behind the Irish embassy in the same country," he said.

Mr Wilson told a Scottish audience in London that Scottish embassies and business agencies would be in head-to-head competition with the UK for trade and foreign investment. "There are, I suppose, plenty of people in Scotland who would be delighted to have 50 diplomatic posts flying

the St Andrews cross [the Scottish flag] without worrying too much about the implications for Scottish businesses and individuals in the 150 countries in which we would thereby have denied ourselves direct representation.

"That is not an argument which I can easily engage in because, frankly, I do not regard it as rational. The idea that Scotland should cut itself off from this network is just plain crazy."

Mr Wilson, a Scot, is the latest minister to attack the idea of an independent Scotland. Some Scottish Labour MPs have criticised the tactic in the wake of Labour's poor showing in last week's North East Scotland European parliament by-election.



Brian Wilson: nationalist proposals are 'plain crazy' Brendan Carr

"Any attempt to discuss serious issues, and the implications for Scotland, is now met with the cat-call that this constitutes 'Nabashing'." he said. "However, the vital debate about the prospects for hundreds of thousands of Scottish jobs

cannot be suppressed by cat-calls."

He said the idea that Scotland could become independent "without enormous implications for business and for jobs is simply a naive avoidance of the realities I want to see addressed."

Interest rate policy 'takes account of jobs level'

By Robert Chote, Economics Editor

The Bank of England pays close attention to unemployment when setting interest rates, even though it is not an explicit part of its objectives, a senior official from the UK central bank said yesterday.

Mervyn King, deputy governor responsible for monetary stability, said in a speech last night that the monetary policy objectives need not include explicit reference to jobs. The Bank of England's new strategy, announced last month, has argued that it should and Oskar Lafontaine, German finance minister, has urged its inclusion for the putative eurozone.

Advocates of an employment objective point to the US Federal Reserve, which is charged to pursue "the goals of maximum employment, stable prices and moderate long-term interest rates."

But Mr King argued that the Fed did not in practice behave differently from the UK Bank. "Under Alan Greenspan's leadership, the Federal Open Markets Committee has firmly rejected the notion that by accepting a somewhat higher rate of inflation it is possible to achieve a permanently higher level of employment," he said.

But the Bank does what it can to minimise undesirable volatility of output and employment, said Mr King. It does so by bringing inflation back to its target gradually if it strays.

Unemployment is an important input into the Bank's policy-making process but concepts such as the "natural rate of unemployment" and the "non-accelerating inflation rate of unemployment" (Nairu) are of limited value as practical guides, Mr King said.

The natural rate is the level of unemployment consistent in the long-term with stable inflation. It depends on the structural characteristics of labour and product markets, for example, the level of the minimum wage. The Nairu is the unemployment rate at which there is no immediate pressure for a change in the inflation rate, reflecting inertia in the way the economy adjusts.

Mr King said knowledge of the natural rate was not sufficient to predict inflation. Estimates of the Nairu are in turn by-products of the inflation forecasting process, rather than an input into it. Neither can provide a meaningful target. Policymakers should, however, be more concerned by the levels of output and employment than their growth rates.

Mr King also rejected accusations that the Bank had paid too much attention to the now-discredited official estimates of average earnings growth.

He also downplayed the idea that 4.5 per cent was a "magic threshold" between acceptable and unacceptable rates of earnings growth.

Former Barings directors to be banned

By John Mason, Law Courts Correspondent

Three former directors of the collapsed Barings Bank are to be disqualified from acting as company directors after a High Court judge yesterday ruled they displayed "such a degree of incompetence" they should not be involved in company management.

Andrew Tuckey, former deputy chairman, Ronald Baker and Anthony Gamby now face a further hearing to decide the length of their disqualification. Barings, the

London merchant bank, collapsed in February 1995 after Nick Leeson, a Singapore-based derivatives trader, ran up losses that eventually cost the bank £27m and forced its collapse.

Mr Justice Jonathan Parker, the judge, heard disqualification applications brought by the UK government's Department of Trade and Industry in May this year. The three men were accused by the DTI of "serious failures of management in relation to Leeson's activities, thereby demonstrating incompetence of such a high

degree as to justify a disqualification order."

The judge said that Barings paid 50 per cent of group profits into a bonus pool for directors and senior employees. Mr Tuckey received a salary of not less than £225,000 a year with a £1.75m bonus in 1993 and a proposed bonus of £1.65m in 1994. Mr Baker, who headed Mr Leeson's division, earned £100,000 a year and was paid a bonus of £900,000 in 1993 with a further £800,000 proposed in 1994. The proposed 1994 bonuses were not paid because of the collapse.

The judge said Mr Tuckey's breach of duty stemmed from a "fundamental misconception as to the extent of his management responsibility". "Had he performed his management duties properly, Mr Leeson's unauthorised activities would almost certainly have come to light and the collapse of Barings might have been avoided," he said.

Mr Baker had shown an "almost cavalier attitude" to Mr Leeson's activities and bore a heavy responsibility for the Barings collapse, he said. Again, had he per-

formed his duties properly, then the trader's activities would have come to light and the collapse of the bank avoided.

Mr Gamby, head of settlements, displayed a "culpable inactivity" in allowing Mr Leeson to run up such debts and was partially to blame for failing to expose the trader's activities, the judge said. The three men face periods of disqualification of up to 15 years. Other former Barings directors have already been disqualified for periods of up to five years. The case continues.

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NEWS DIGEST

PRIVATISED UTILITIES

Biggest water group urges easing of takeover rules

Britain's biggest water company has asked the government to clear the way for a wave of takeovers in the industry. Bill Alexander, chief executive of Thames Water, says consumers would be better served if the current 10 water and sewerage companies were whittled down to a smaller number of UK-owned businesses. The company is to press John Prescott, deputy prime minister, to consider changes to the industry's regulatory regime to make it easier for UK water companies to take over rivals. Mr Alexander believes the water industry would be more robust – and better equipped to invest in projects worldwide – if it slimmed down to a handful of companies.

"We would be happy to work with the government on how legislation might be brought forward," he said. Under the 1991 Water Industries Act, all mergers between big water companies are automatically referred to the Monopolies and Mergers Commission. The referral gives overseas companies – notably from the US and France – the chance to make a rival bid.

Thames has invested in a number of international projects, including schemes in Puerto Rico and China, but is getting restless at its inability to expand at home. Mr Alexander said he hoped Mr Prescott would adopt a "pragmatic" approach which would allow rationalisation in the industry. "We believe the UK would be better served by a possibly smaller number of robust, competitive and UK-owned companies, than by 10 vulnerable or actually foreign-owned companies," he said. George Parker, London

IMMIGRATION

Controls to be speeded up

Visitors to the UK would experience fewer delays at immigration control under plans from the British Tourist Authority and Immigration Service to co-operate on speeding up the system. The BTA said most visitors were entitled or qualified to be in the country and delays should be kept to a minimum. The memorandum of understanding, jointly published yesterday by the two government agencies, gave no timeframe for implementation but said that increased co-operation would lead to greater efficiency. The UK attracted 25.5m visitors from overseas last year, according to official figures, a 26 per cent increase on 1995. Elizabeth Robinson, London

TECHNOLOGY

US group boosts Scotland plant

SMART Modular Technologies, a designer of memory cards and embedded computers based in Fremont, California, yesterday announced an expansion at its European manufacturing headquarters in East Kilbride, central Scotland. The workforce at the plant, opened two years ago, will increase from 250 to 370 over three years.

THE ECONOMY

Factories faces 'bloodbath'

The UK manufacturing sector faces "a bloodbath" if current trends continue, according to the latest monthly survey of the industry. Manufacturers reported falls in levels of output, orders and the price of goods they produce, to record lows in November. The Chartered Institute of Purchasing Managers, which compiled the index of more than 300 manufacturing companies, said the sector contracted at its fastest rate for seven years. "What is really depressing is that domestic demand is so weak," said Peter Thomson, the institute's director. The overall index fell for the eighth consecutive month in November to 41.1 compared with 41.4 in October.

An index reading below 50 implies the sector is shrinking. The reading is the lowest since January 1992, when the survey began. Richard Adams, London

CORPORATE GOVERNANCE

Vote recommendation snubbed

Nearly half of the UK's 350 biggest companies are failing to comply with recommendations on voting disclosure set out in the Hampel report on corporate governance this year. Pensions Investment Research Consultants reported yesterday. PIR found that 172 companies – 49 per cent – failed to disclose the results of their proxy votes at this year's round of annual meetings. The report from the committee headed by Sir Ronald Hampel, chairman of ICI, recommended that companies should provide voting figures when asked by shareholders.

Under the current system proxy votes, lodged mainly by institutional investors, are disclosed only in the rare event of a shareholder poll. Jamie Martinson, London

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NOTICE OF MEETINGS
Since no quorum as required by law was present at the extraordinary shareholders' meeting held on November 9, 1998, notice is hereby given to the shareholders of MFS AMERICAN FUNDS for a SECOND extraordinary shareholders' meeting shall be held before noon, at the registered office of the Company, 42 Boulevard Royal, Luxembourg on December 16, 1998 at 10.00 a.m. local time with the following agenda:

1. Change of the name of the Company from MFS FUNDS and amendment to Article 1 of the Articles of Incorporation to replace the current name by "MFS FUNDS".
2. Change of capital currency from US Dollars to EURO as from February 1, 1999 and amendment of Article 5 paragraph 2 of the Articles of Incorporation to be recorded as follows:
"The minimum capital of the Company shall be the equivalent in US Dollars, respectively in EURO, as from February 1, 1999, of fifty million Luxembourg francs (50,000,000 - LUF)."
3. Amendment to Article 5 paragraph 3 of the Articles of Incorporation to be recorded as follows:
"The initial subscribed capital was US Dollars 50,000,000. (Fifty thousand) divided into 2,500,000 (two thousand two hundred fifty thousand) fully paid Class B shares of the MFS INTERNATIONAL FUNDS - US EQUITY FUND, currently MFS FUNDS - US EQUITY FUND, 2,500,000 (two thousand two hundred fifty thousand) fully paid Class B shares of MFS INTERNATIONAL FUNDS - US EMERGING GROWTH FUND, currently MFS FUNDS - US EMERGING GROWTH FUND, and 2,241,885 (two thousand two hundred forty-one thousand eight hundred and five) fully paid Class B shares of the MFS INTERNATIONAL FUNDS - INTERNATIONAL GOVERNMENTS FUND, currently MFS FUNDS - US HIGH YIELD BOND FUND. The shares are of no par value."
4. Change of the date of the holding of the annual general meeting and amendment to Article 7 paragraph 1 of the Articles of Incorporation to replace "the last Monday of April beginning in 1999 at 10.00 a.m. local time" by "the first Monday in June at 10.00 a.m. local time".
5. Amendment to Article 16 of the Articles of Incorporation in order to add a new 16th paragraph worded as follows:
"The Company may in its sole discretion meet individual redemption requests in and if any are greater than an amount to be determined from time to time by the Board of Directors."
6. Amendment to Article 18 paragraph 2 of the Articles of Incorporation to replace "only reference to US Dollars" by a reference to "the Fund's Base Currency".
7. Amendment to Article 19 paragraph 1 of the Articles of Incorporation to be completed to read by: "as well as to any other services provided appointed from time to time by the Board of Directors."
8. Change of the fiscal year and amendment to Article 20 paragraph 1 of the Articles of Incorporation to be recorded as follows:
"The fiscal year of the Company shall start on the 1st day of February each year and shall end on the 31st day of January of the following year."
9. Decisions concerning the extension of the current fiscal year until January 31, 1999 (January 1, 1998 until January 31, 1999).
10. Amendment to Article 22 paragraph 1 of the Articles of Incorporation to complete sentence 1st line by: "... or its equivalent in any other currency."

There will be no quorum requirement and the resolutions will be passed by a majority of 2/3 of the shareholders present or represented and voting at the meeting. Each share is entitled to one vote.

Proxies should arrive at the registered office of the Company at least 48 hours before the meeting.

In order to attend the meeting, the owners of bearer shares will have to deposit their shares two clear days before the meeting at the registered office of the Company.

By order of the Board of Directors

هكذا من الكمال

Former minister defends role in BSE crisis

The cases related to BCCI are part of the complex network of more than 1,000 legal actions which have so

and the news that there was a link in 1996 came as a "thunderbolt". He told the inquiry: "This was the biggest emergency of my political career."

The company has also expanded into a variety of products unrelated to aircraft.

patent drugs and other products sold to the state health services but the key to its

"We are limited mainly by our ability to employ suitably qualified staff," he says.

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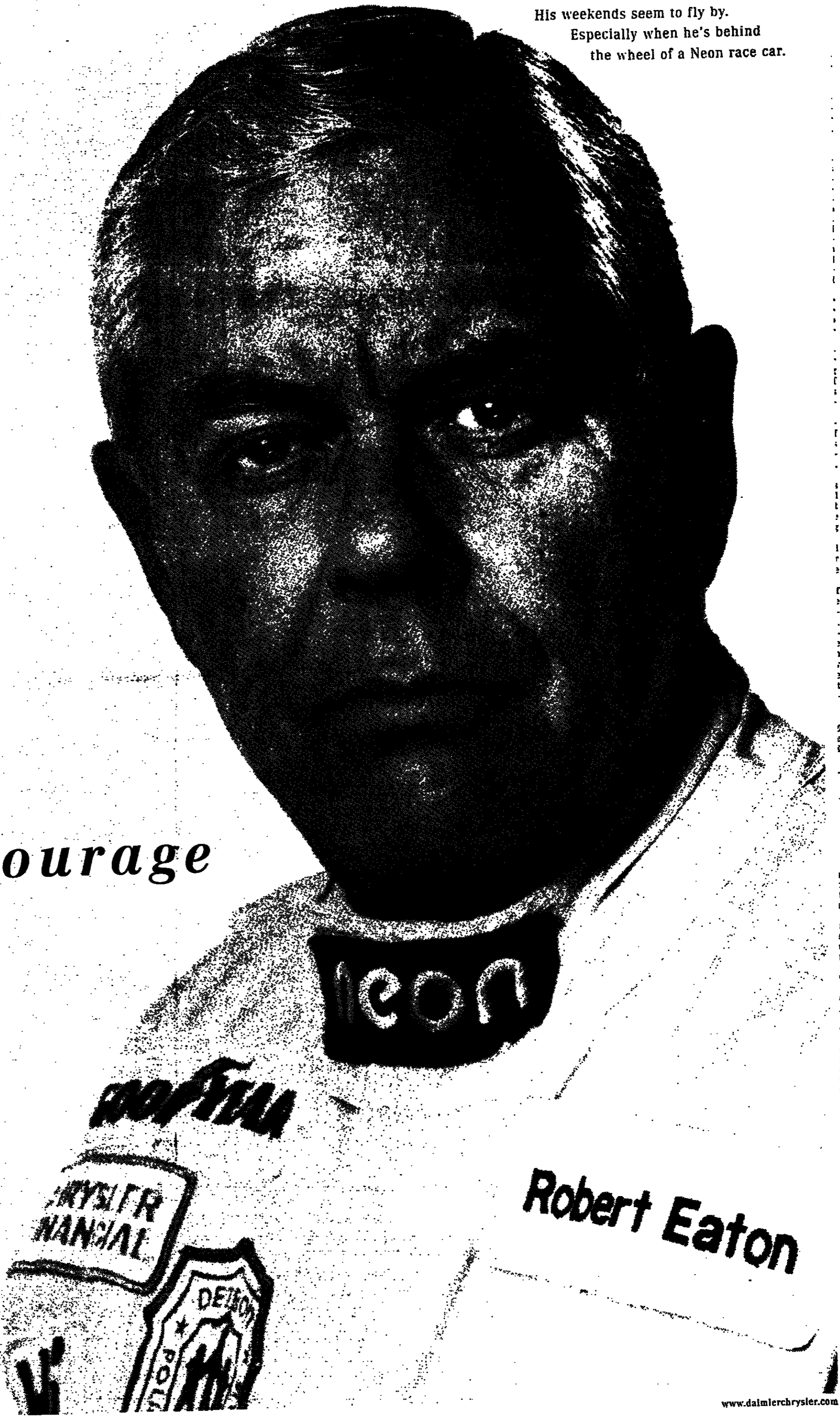
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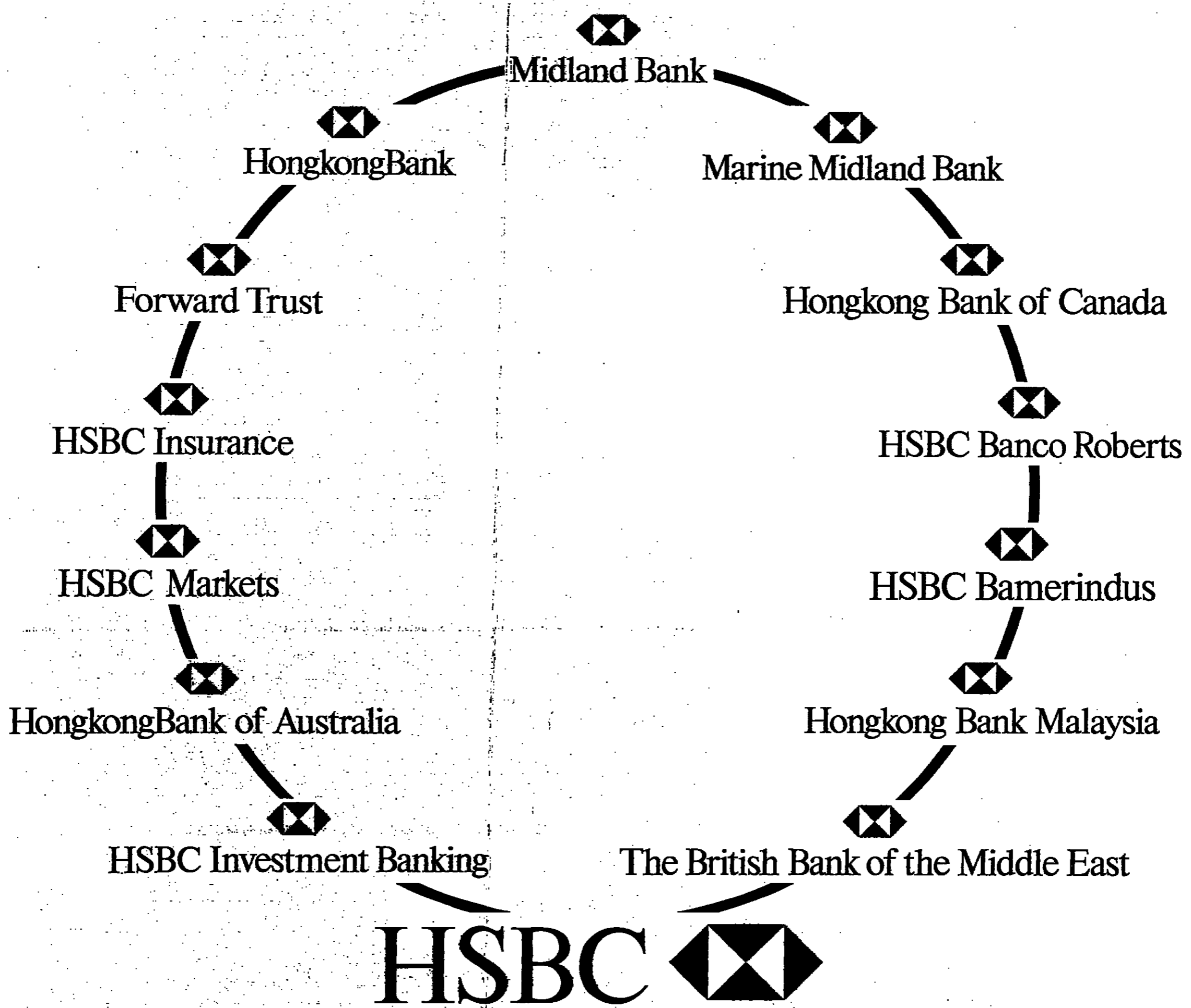
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COMPANIES & FINANCE: THE AMERICAS

CANADA COMPANIES SELECTED

TSE, S&P set to launch new index

By Scott Morrison in Toronto

The Toronto Stock Exchange and Standard & Poor's were preparing yesterday to announce the companies listed on the new S&P/TSE 60, a large capitalisation index that is expected to be a barometer for Canada's leading securities market.

The index, which will be part of S&P's global basket of investable indices, aims to provide greater international exposure to Canadian companies and enhance liquidity. It is set to be launched on December 31.

Richard Carleton, TSE vice-president of index and market data services, said the TSE 60 would be the basis for futures and options instruments, as well as index participation units. The TSE and S&P were also considering sector-related units - for example, natural resources - based on S&P's global index.

The new index initiative is part of the TSE's strategy to increase market liquidity and fend off competition from US stock markets.

It is the first product to emerge from a partnership announced this year between the exchange and S&P, which manages the widely followed US benchmark index, the S&P 500. Mr Carleton said the partnership enables the TSE to leverage S&P's international exposure to market Cana-

dian companies to global investors.

Bill Riedl, president of Fairvest Securities, said inclusion in the TSE 60 would be important to companies, given the growing interest in index investment funds by pension funds and other institutions. "A large percentage of investment capital will be strictly focused on that group," he said.

The TSE 60, designed to be a large market capitalisation portfolio index, will feature companies selected on liquidity, sector leadership, share float and fundamentals such as earnings performance and debt to equity ratio.

Investors have for several weeks been taking positions in anticipation of the new index, hoping to reap a listing premium or avoid a discount to a company's share price if it is not included.

Dealers said it was impossible to calculate the size of the premium, or discount, given that position-taking prior to yesterday's announcement was likely to reduce the impact.

Mr Carleton said the TSE 60 and the TSE 100 would continue to be calculated due to demand from investors holding a number of derivative instruments tied to the indices, such as equity side deals and other over-the-counter instruments with fixed terms.

Turning over a new leaf

Publisher Dow Jones plans to build on the strengths of the Wall Street Journal after a tough year, writes John Gapper

For Peter Kann, chairman and chief executive of Dow Jones & Co, publisher of the Wall Street Journal, the past few weeks have provided some grounds for optimism towards the end of a difficult year.

Despite the dominance of the Wall Street Journal in US financial markets, and some successful initiatives such as the Interactive Edition of the Journal, the previous months were a struggle.

Ownership of the loss-making Dow Jones Markets real-time financial information group depressed its shares early in the year, and provoked criticism from some dissident members of the controlling Bancroft family. There was a temporary respite after the company succumbed to pressure and sold Dow Jones Markets for \$510m in May, but this lasted only until the summer. Then fears of a recession in advertising caused renewed weakness.

Mr Kann's strategy of trying to close the book on the past and looking towards a future in which Dow Jones replicates its newspaper strengths in other fields was put to analysts late last month. His presentation followed the announcement of the early retirement of Kenneth Burenga, president of the company and chief executive of Dow Jones Markets, and plans for the repurchase of \$500m of the company's shares.

Mr Kann, a former editor and reporter who has had to defend his abilities as a business executive, has learned a lesson in humility from his troubles. "The management has a high degree of self-imposed pressure to do better," he says.

His presentation laid out a three-year plan to expand Dow Jones' electronic publishing businesses, and improve margins in operations such as Ottawa, which publishes 36 community newspapers.

Family control of Dow Jones has given Mr Kann at least one comparative advantage in laying long-term plans for the group. Despite vocal criticism from two family members, he believes the Bancrofts have little interest in selling.

Despite occasional rumours about a possible sale or merger, Dow Jones appears set in its ways. "Even the critical members of the family were not trying to sell the company, and we are not going to sell the company, or merge," he says.

In a sense, Dow Jones has been a victim of its own success. The dominance of the Journal - a competitor of the Financial Times - in the US has made it hard to find another related activity that can produce comparable profits.

Dow Jones Markets was a failure and the company has lagged behind in areas such as marketing its stock market indices. It is now focusing more strongly on electronic publishing, both in newswires and specialist information.

The fastest-growing operations are the Interactive Edition of the Journal, which has 250,000 paying subscribers on the Internet, and Dow Jones Interactive, an online business information division that reaches 600,000 users via terminals.

Mr Kann insists there is little risk of these kinds of publishing operations falling

into the same trap as Dow Jones Markets, which proved less nimble than competitors such as Bloomberg.

"The core of this content is proprietary, and we're serving the same kind of market we serve with our print papers. It is a business we have a fair amount of experience in, and have been reasonably successful at."

The company is still finding its way with the Interactive Edition of the Journal, since it is among the first publishers to charge for access to a newspaper on the Internet. The subscription charge is still well below the price of the printed Journal, which costs \$175 a year.

The Interactive Journal costs print subscribers \$29 a year, and others \$59. "Over time, it is our goal to bring the rates close to print. We

want to say that our information has value," Mr Kann said.

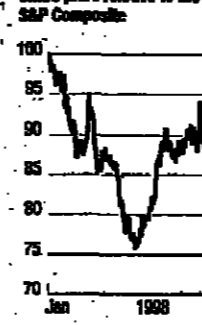
Dow Jones is also distributing the Journal's content over television via a joint venture with CNBC - the cable network owned by NBC. It licenses information to CNBC, and gains a share of CNBC's additional advertising revenue.

As part of the same agreement, Dow Jones and NBC combined their loss-making international television operations, which have been hit by Asian turmoil and are together likely to lose about \$50m this year.

"A year ago, our television side was viewed as something of a problem, but I don't think it is seen that way any more. It is quite significantly profitable in the US, and we are reducing

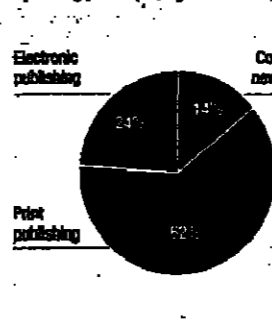
Dow Jones

Shares price relative to the S&P Composite



Source: International Company

Operating profit (average 1995-97 %)



* Excluding newspaper and corporate expenses



Peter Kann, Chairman and Chief Executive Officer of Dow Jones and Company

overseas losses," he says.

But as Dow Jones' experience since late August shows, none of these other ventures matters as much to its share price as advertising in the Journal. Shares dropped from \$58 in late July to \$42 in mid-October on signs of weakness.

The sale of Dow Jones Markets has made it more vulnerable to the advertising cycle by reducing subscription revenues.

However, Mr Kann insists the strength of the Journal protects it somewhat from the cycle.

"Even if you assume there is a recession, well OK, who does best and who comes out in the best shape? If there is a down market and customers cut back a bit, we'll do well in that kind of environment."

Strict budget for state oil group

By Raymond Collitt in Caracas

Venezuela's general assembly is today set to approve a strict budget for Petróleos de Venezuela, the state oil company, with only minimum investments to maintain current production capacity.

The budget proposal allows about \$6bn in operational costs and \$4bn in capital investment, of which an estimated \$3.6bn would go to maintain current production capacity.

"There will be no expansion of capacity next year. It's an austerity budget," said one person in the industry familiar with the budget proposal. "Given the oil price and the country's fiscal situation, there is no money to spare."

For 1999, PDVSA foresees an average production of 3.17m barrels a day. That is slightly up from this year's average of 3m b/d, but far below the 3.8m b/d the company had originally predicted for the end of this

year. PDVSA expects an average price of \$11.50 for the Venezuelan basket of crude oils, but "may revise this figure downward" the source said.

"PDVSA has been hit hard this year. It has made production cuts of 525,000 b/d under an agreement with leading oil-producing nations in an attempt to stem the fall in prices. PDVSA has also had to pay additional dividends to help finance the government's budget deficit, bringing its total fiscal payments to \$7.45bn in 1998. Some observers question whether PDVSA will be able to pay \$1,000bn in dividends next year, as stipulated in the government's 1999 budget."

Expenditure and production cuts from the collapse of oil prices hit not only next year's output but also PDVSA's long-term expansion plans. The company now expects to reach production capacity of 6.2m b/d in 2006, rather than the forecast 6.2m b/d in 2007.

NEWS DIGEST

MAGNETS

Bogatin resigns as YBM Magnex president

The president and chief executive of YBM Magnex International, the troubled Canadian magnet maker under police investigation, has resigned. YBM said late on Monday that Jacob Bogatin, who headed the company since it first began trading in Canada in 1994, had also resigned as a director. Wesley Voorheis, YBM chairman, declined to comment on the resignation and Mr Bogatin did not return calls seeking comment.

YBM has been suspended from trading on the Toronto Stock Exchange since last May, when its Pennsylvania headquarters was raided by the FBI in a police investigation of alleged money laundering activities.

YBM's institutional investors, headed by Mr Voorheis, ousted the company's board of directors in September. The new chairman promised he would quickly get to the bottom of the controversies plaguing the company so it could resume trading.

But Mr Voorheis has said nothing about the company's future since that time, and investigations by police and securities regulators are continuing. Edward Alden, Toronto

FINANCIAL STABILITY INSTITUTE

First chairman appointed

John Helmann, chairman of global financial institutions and a member of the executive management committee of Merrill Lynch, will retire on February 1 to take up a position as the first chairman of the Financial Stability Institute.

The institute was established by the Bank for International Settlements earlier this year to promote better and more independent supervision of the banking, capital markets and insurance industries. It is a joint initiative of the BIS and the Basle committee on banking supervision.

William McDonough, president of the Federal Reserve Bank of New York and chairman of the Basle Committee, said: "As a respected former regulator and a senior executive of a major financial institution, [Mr Helmann] has extensive knowledge of both supervisory challenges and financial market practices." Tracy Corrigan, New York

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Deutsche Bank



COMPANIES & FINANCE: UK

COMMENT

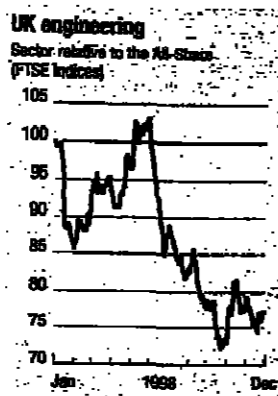
Engineering M&A

Siebel's pounce on BTR has renewed hopes of a bidding spree among UK engineers. But investors should look more closely before getting excited. Many Siebel followers are dismayed that an engineer doing a fair job of focusing on higher value activities should want to inherit a scattered, problem-ridden group. But most UK engineers are similarly diversified - think of IML, FKI or even BBA. As their organic growth has dried up, they have become more restless in their hunt for deals, but perfect fits will be hard to find. And the looser the fit, the more questionable the synergy benefits. BBA and TI Group are among those seeking "step change" acquisitions. Roberto Quarta cannot afford to ruin BBA's premium reputation by diversifying further, however. Meanwhile, Sir Christopher Lewington could be short of sensible targets in the UK if Vickers' bid for Ulster Holding succeeds, and the chance of finding bargains in the US look slim.

US buyers have not been put off cash bids by goodwill accounting, but some are toying with all-share pooling deals. As LucasVarity found out, however, some London investors are still nervous about taking American paper. The other problem with US pooling rules is that the buyer cannot make significant disposals within two years of the deal. Unless buyers can wield the axe on non-core businesses, their acquisition plans risk destroying both focus and value.

Cortecs

Or not, not another biotechnology company that got carried away with its own optimism. In the wake of the British Biotech debacle, that is the kneejerk reaction. In Cortecs' case, there is also truth in the interpretation, but it is out of date. Once a biotech company has reformed its founding messianic board, as Cortecs did earlier this year, it is inevitable that the work in progress will be found wanting. It is good news that the company now has a more heavyweight team and is inviting independent assessment of its projects. Also welcome was the lack of a kneejerk reaction among other biotech stocks. As the sector grows up - and Cortecs demonstrates the necessary pain of this process - the better run companies will become more immune to others' embarrassment.



BIOTECHNOLOGY SECTOR RECEIVES FURTHER BLOW AS COMPANY ADMITS DELAYS WITH TWO DRUG DEVELOPMENT PROGRAMMES

Two senior Cortecs directors to resign

By Virginia Marsh

Cortecs, the UK biotechnology company, yesterday admitted that two of its three lead drug development programmes were running behind earlier forecasts, and said its chief executive and chief operating officer had agreed to resign.

The news is a further blow to the UK biotechnology sector which was shaken this year by allegations that British Biotech, another quoted

company, misled investors by exaggerating the efficacy of drugs under development. Shares in Cortecs - already hit by a row over its former chairman's pay package and a looming funding shortfall - more than halved, falling 15p to 11p. Last February, they stood at 19p. The company said new regulations meant it might have to collect extra data to secure approval for Macritonin, its osteoporosis treatment, in Europe.

This would "delay significantly" any product registration, perhaps until 2004. This was the earliest likely date for a US application, too.

In addition, the treatment might have to be reformulated using a higher dosage, threatening its profitability. Cortecs also said it was having to conduct extra early stage trials for Pseudostat, its cystic fibrosis and bronchitis treatment.

One feels misled on some of the programmes," said

Nick Woolf, analyst at Banc Boston Robertson Stephens. "The level of optimism on the part of the former management was overdone."

However, other analysts said they were relieved that Macritonin, oral insulin and a potential blockbuster, appeared to be on track.

The problems emerged during an internal review led by Phil Gould, a former Glaxo Wellcome executive, who joined Cortecs as research director in January.

Mr Gould has now been appointed acting chief executive following the departure of Michael Flynn. Martin Preuveens, chief operating officer, is also leaving.

Mr Flynn, formerly chief scientific officer, became acting chief executive in June after the resignation of Glen Travers, executive chairman. Mr Travers, who is claiming £1.5m (£2.5m) in compensation for loss of office, left following unhappiness among investors at slow progress in

striking distribution deals with pharmaceutical companies for Macritonin.

It has since emerged that his pay package included £34,500 for business class flights to Australia for his family and £42,400 for membership of a chief executives' forum. Mr Gould said he had begun to present the findings of his review to Mr Flynn earlier in the year. Last month, he felt obliged to take the matter further and informed the board.

Internet growth lifts LSE

By Jean Eaglesham

The rapid growth in share price internet services for private investors has lifted the London Stock Exchange's income, putting it in a "strong financial position" ahead of its planned alliance with the German bourse.

Despite an 8 per cent fall in income from trading fees, the exchange raised its total income by 8.5 per cent to £75.2m (£125.7m) in the six months to September 30.

Income from internet services, expected to grow fur-

ther as use of the net expands, was a "very important component" of that overall revenue, the exchange said. Listing fees were also buoyant, with a record number of listings during the first half. 121 smaller companies joined the London markets raising a total of £1.2bn.

Income from listings had decreased in the last few months, however, because of market volatility, but trading volumes were holding steady.

The £15.8m of profit transferred to reserves, after tax

and interest, was slightly down on the £18.9m for the same period last year.

A priority was to continue preparations for the euro. "We may not be joining as a country, but we are as an equity market, and we are ahead of the game," it said, citing the various euro-denominated products that can already be listed in London.

The fact that other European exchanges were interested in creating a single pan-European market would not slow down the progress of the planned Anglo-German alliance, it said.

Carlton hit by On Digital

By John Gapper

Carlton Communications yesterday said pre-tax profits had dipped slightly because of the cost of launching the On Digital pay television service.

Despite stronger than expected profits from its ITV licences, including Carlton in London and Central Television, the pre-tax result fell from £16.3m to £12.1m (£15m) in the year to September 30 because of its 50 per cent stake in On Digital.

As well as investing £27.5m in On Digital and the

development of digital channels such as Carlton Food Network, it was also affected by a sharp fall in operating profits in its products division from £52.3m to £22.8m.

The drop was caused by weakness in demand for products such as Quantel post-production and editing equipment in Asia, and by confusion over likely standards for high-definition TV in the US.

Carlton's figures were ahead of analysts' expectations, helped by growth in TV advertising and the start of a fightback by ITV from

falls in its share of viewing. Carlton, which last week announced the appointment of Steven Cain, marketing director of Asda, as chief executive, raised profits, excluding exceptional items and digital television costs, from £26.7m to £30.4m.

Analysts expect Carlton's investment in On Digital, launched in November, to rise to about £80m in the current year. On Digital is providing subsidies to encourage sales of digital set-top boxes.

Turnover rose from £1.75bn to £1.84bn.

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Micro Focus blames fall on poor US sales

By Paul Taylor

The first evidence that work solving the Year 2000 computer date problem may have passed its peak in the US has begun to emerge.

Year 2000 work has helped boost the results of many specialist computer software and services companies and has been one reason for their strong share price performance over the past few years.

Micro Focus, the Anglo-American software development tools and services group, yesterday blamed weakness in North America, particularly in its Year 2000 business, for holding back its quarterly results.

At the same time the group, which acquired Inter-solv in September and issued a profit warning early last month, announced that Gary Greenfield was taking over as chief executive following the resignation of Martin Waters.

Mr Waters, whose departure was said to be "amicable", will remain a non-executive director.

After taking a £11.8m (£19.5m) charge related to the acquisition, Micro Focus reported a £10.9m pre-tax loss for the three months to October 31, against a £3.94m profit.

Losses of 10.9p a share compare with profits of 3.5p. Excluding non-recurring charges and the amortisation of goodwill, pre-tax profit actually increased to £4.62m (£3.94m).

At the operating level, the group broke even in the quarter compared with a £3.3m profit a year earlier. Excluding non-recurring charges and the amortisation of goodwill, the figure edged higher to £3.65m (£3.21m).

Revenues jumped to £40.1m (£28.4m) reflecting the inclusion of the Inter-solv business from September 24. Micro Focus, which now derives 60 per cent of revenue from the US, issued a profit warning last month, noting that demand for products to tackle the millennium bomb had fallen.

Yesterday the group, which provides software services to corporate customers, said its Year 2000 business had been affected "by increased competition and customers moving to the later stages of their remediation processes, for which [it] did not have the appropriate products until November".

Mr Greenfield said the group's European operation remained very strong. The shares fell 8p to 117p.

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OTHER OFFSHORE FINDS

Highs & Lows shown on a 52 week basis

EUROPE

Austria (Dec 1/Thu)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

Belgium (Dec 1/Fri)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

France (Dec 1/Fri)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

Germany (Dec 1/Fri)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

Italy (Dec 1/Fri)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

Netherlands (Dec 1/Fri)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

Portugal (Dec 1/Fri)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

Spain (Dec 1/Fri)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

Sweden (Dec 1/Fri)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

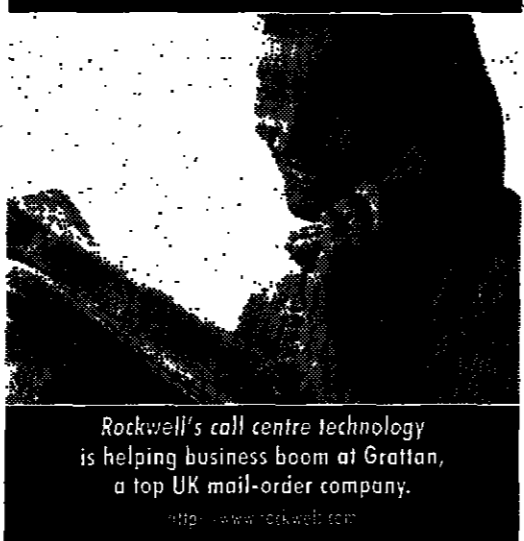
Switzerland (Dec 1/Fri)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

United Kingdom (Dec 1/Fri)

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

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DOLLAR INDEX									
FRIDAY NOVEMBER 27 1998									
US Dollar Index	Day's Change	Point	US Dollar Index	Day's Change	Point	US Dollar Index	Day's Change	Point	US Dollar Index
US Dollar Index	Day's Change	Point	US Dollar Index	Day's Change	Point	US Dollar Index	Day's Change	Point	US Dollar Index
Australia (76)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Canada (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
France (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Germany (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Italy (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Japan (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Netherlands (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Portugal (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Spain (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Sweden (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Switzerland (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
United Kingdom (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
USA (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
EMERGING MARKETS									
Brazil (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
China (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
India (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Indonesia (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
South Africa (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Taiwan (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
Thailand (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00
USA (22)	102.00	-1.1	102.00	102.00	102.00	102.00	102.00	102.00	102.00

Emerging markets:

IFC investable indices

Dollar Index

Index	High	Low	52w High	52w Low
Asia	102.00	102.00	102.00	102.00
Europe	102.00	102.00	102.00	102.00
Latin America	102.00	102.00	102.00	102.00
Middle East	102.00	102.00	102.00	102.00
South Africa	102.00	102.00	102.00	102.00
Taiwan	102.00	102.00	102.00	102.00
Thailand	102.00	102.00	102.00	102.00
USA	102.00	102.00	102.00	102.00

AFRICA

South Africa (Dec 1/Fri)

4 pm close

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

AMERICAS

Canada (Dec 1/Fri)

4 pm close

Stock	High	Low	52w High	52w Low
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80
Alpine	11.20	11.00	11.20	10.80

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INDIA: INFORMATION TECHNOLOGY

WEDNESDAY DECEMBER 2 1998

Supplement to the FT-IT Review

New IT mantra attracts a host of devotees

The country has become one of the world's main centres for offshore software development work, reports **Paul Taylor**

India has a new mantra - Information Technology - and almost everyone is chanting it.

The success of India's exported software development industry has helped to put IT at the top of the political agenda and turned it into a model for the modernisation of an otherwise troubled economy.

"Everyone is talking about IT," says Sudheendra Kumar, a member of the prime minister's office and one of the driving forces behind the recently published report from the National Task Force on Information Technology and Software Development which envisages building Indian software exports into a business worth at least \$50bn a year by 2003.

While India's BJP-led coalition government has made fostering software development and the domestic IT industry one of its top priorities, state politicians have woken up to the potential economic and other benefits of attracting new IT investment.

Almost every Indian state has adopted its own IT development policy, including steps to encourage the use of computers in government.

Meanwhile, investors and senior industrialists have watched as the profits and share prices of India's leading domestic IT groups have soared, turning a new generation of entrepreneurs into

millionaires and fuelling the aspirations of many young Indians to become the next Bill Gates, Larry Ellison or Charles Wang.

Today, in cities such as Bangalore, Bombay, Delhi and Madras, as well as emerging centres such as Pune and Hyderabad, leading Indian software companies battle with their US and European IT rivals to hire the brightest and best engineers each year from the India's premier universities and technology institutes.

When Bangalore, India's

unofficial high technology capital, hosted a recent five-day IT.Com 98 exhibition, opened by prime minister Atal Behari Vajpayee at the newly completed International Technology Park, more than 70,000 people turned up every day, including thousands of students.

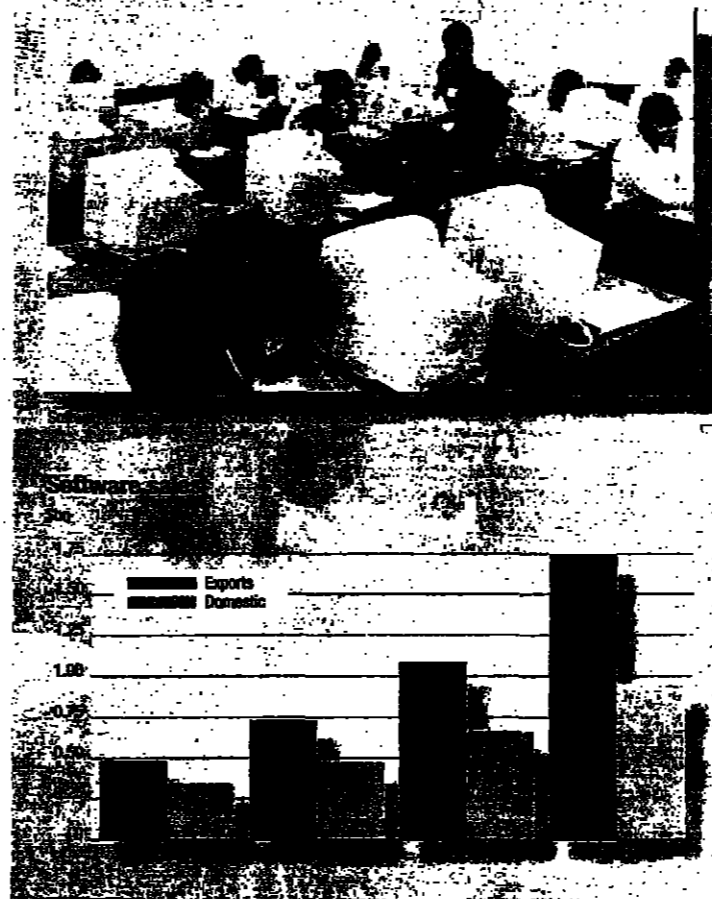
So many students came to the show in India's southern state of Karnataka, many of them travelling hundreds of miles overnight, that the organisers complained that potential investors could not get in.

At the end of the show one official told the local paper: "Whether we have succeeded in attracting investors to Karnataka or not, we have definitely succeeded in creating potential IT professionals from the state."

Ultimately, that may prove just as valuable because India will need an expanding supply of IT professionals if its software development industry is to continue to grow at the present 50-55 per cent annual rate.

The Indian industry, although still small by international standards, has been growing rapidly since the mid-1980s, fuelled by domestic deregulation, entrepreneurial flair and the soaring global demand for low-cost, high-quality software and services which have turned India into one of the world's main centres for offshore software development work.

Today, Indian software



companies sell their services to an expanding international customer list which includes Japanese, South Korean and south-east Asian clients as well as those from North America and Europe on the basis of quality, speed and reliability, innovation and skills as well as price.

Many other IT companies from the US and Europe, including Texas Instruments, Motorola and Oracle from the US, have established captive research and development centres in India.

Recent additions to the roster of foreign investors include Germany's SAP, Alcatel of France and Japan's Sony while Microsoft and Sun, the Netherlands-based enterprise resource planning software

group, have both set up new operations in Hyderabad, India's fastest growing IT centre.

According to annual figures prepared by the National Association of Software & Services Companies (Nasscom) in Delhi, India's software exports jumped from \$1.1bn to \$1.75bn in the year to March 31, pushing the overall value of India's IT sector including domestic software and hardware sales to more than \$5bn.

Predictions

Dewang Mehta, Nasscom's executive director, expects export revenues to be worth \$2.7bn in the current year and to reach \$4bn by the end of the decade and he considers the government's target

of \$50bn in annual exports with 10 years to be "conservative".

Just six years ago, industry shipments totalled less than \$400m. That this should have been achieved in a developing country still struggling with a wide range of infrastructure problems and other obstacles is a remarkable achievement and testament to the determination of the architects of India's software industry.

They include the founders of a clear top tier of Indian software companies that is beginning to emerge as the industry begins to mature. Most of them are among the top 20 exporters, including companies such as Tata Consultancy Services, Wipro Infotech, NIT, Sonata and Infosys Technologies, which

account for about 60 per cent of total exports.

India's success and its ability to outshine rival offshore software development centres including China, the Philippines and eastern Europe, at least for the time being, reflects a number of factors, including the growing shortage of software engineers in the west.

As a result hundreds of companies from a wide range of industries including the IT, financial services and transport sectors, have turned to India's computer software and services companies for the IT skills they need to maintain and enhance their competitiveness.

This skills shortage has been exacerbated by the year 2000 computer date problem

and the imminent launch of the euro in Europe, both requiring massive conversion programmes in order to make existing IT systems and software compliant.

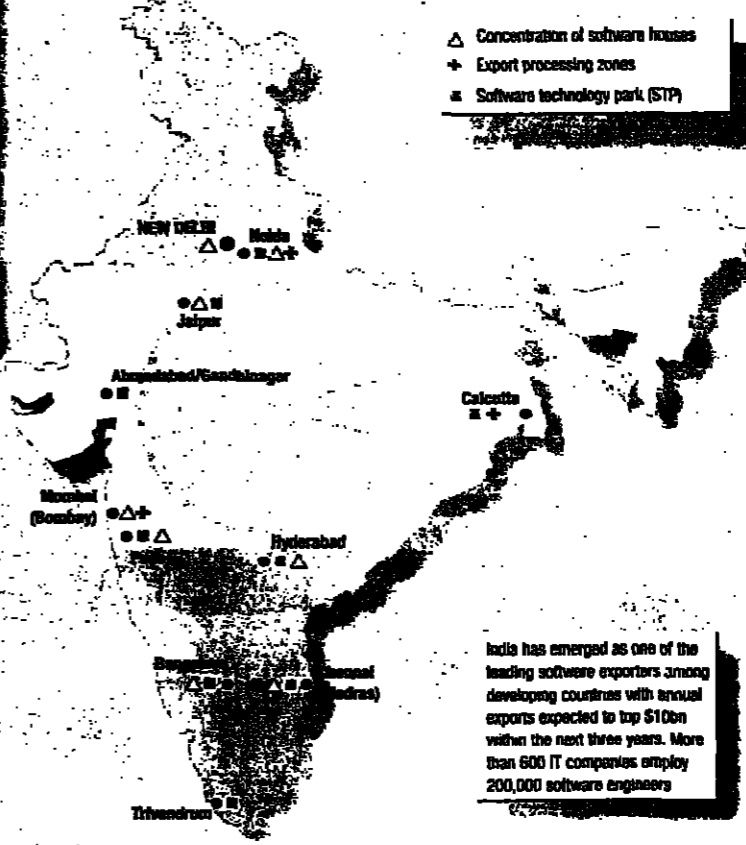
India's geographic position has given the sub-continent a time zone advantage over both Europe and the US, enabling local companies to exploit the rapidly expanding international market for outsourced software services including remote maintenance.

Indian software engineers can fix bugs or upgrade systems overnight while their users in Western companies sleep. However, in an industry in which the main asset is people, it is India's

Turn to back page of this report

India's silicon cities

- △ Concentration of software houses
- ◆ Export processing zones
- Software technology park (STP)



India has emerged as one of the leading software exporters among developing countries with annual exports expected to top \$10bn within the next three years. More than 600 IT companies employ 200,000 software engineers

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SOFTWARE EXPORTS by Paul Taylor

Remarkable growth rate continues

Foreign earnings have been moving ahead to record levels, with the US leading the accelerating demand for Indian software

India has emerged as one of the leading software exporters among developing countries with annual exports expected to top \$10bn within the next three years.

"Exports have been growing very healthily," says Pradeep Gupta, managing director in India of International Data Corporation, the market research firm.

"We think that we have just scraped the surface," adds Sudhakar Ram of Mastek, one of India's top 20 software exporters.

The remarkable success of the Indian software export sector since the mid-1980s is reflected in the annual figures prepared by the Delhi-based National Association of Software and Services Companies (Nasscom).

Last year alone (1997/98), software exports grew by more than 67 per cent in volume terms and 55 per cent in terms of value to Rs65.3bn (\$1.75bn).

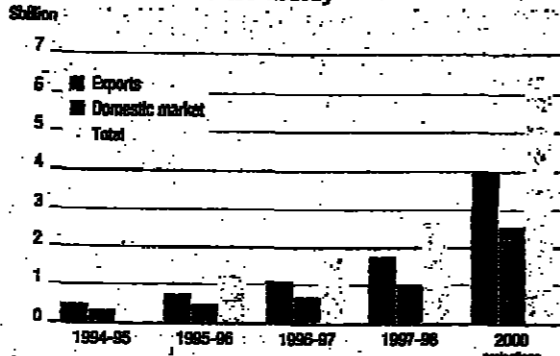
Despite delays earlier this year in the approval of additional HSB visas for Indian software engineers working "on-site", and the threat of sanctions following the Indian nuclear tests, Nasscom still expects export revenues to grow by at least 50 per cent to Rs100bn (\$2.7bn) in the current year.

Overall, software exports have been growing by more than 55 per cent annually over the last five years and the pace of growth shows no signs of slackening. "Last year was the highest growth rate ever for the Indian software export industry," says Dewang Mehta, Nasscom's executive director.

This growth partly reflects special factors like the surge of year 2000 conversion work triggered by the looming millennium computer date problem.

But it also reflects the growing maturity of India's software industry, and greater customer confidence in the industry's ability to deliver high quality products and services on time and within budget. These factors also help explain why,

Projections for the software industry



Source: Nasscom

despite rising wage costs, India has been able to continue to increase the software export business in the face of growing competition from programmers in countries like Russia, China and the Philippines.

"India is unique in that it has a very highly educated population," says L S Kanodia, chairman of Datamatics, one of the fathers of India's software revolution.

"The other great plus from the international point of view is that India is English-speaking in contrast to China and other countries."

Indeed, driven by the demands of offshore clients for low-cost, high-quality products and services, India's software export industry has become one of the most dynamic sectors of the Indian economy, a valuable foreign exchange earner and an important source of new professional jobs for India's expanding young middle class youth.

Indian software engineers maintain and update systems to help companies in the developed world remain competitive and react quickly to commercial opportunities. In the US, Europe and now Asia, a growing number of companies in the financial services, retail and manufacturing sectors are increasingly dependent on Indian technical know-how.

The US is predictably India's biggest export market. About 50 per cent of

Indian software exports go to the US and almost 160 out of the Fortune 500 companies outsource their software requirements to India last year.

Europe is India's second biggest software export market and accounts for a growing share - 22 per cent last year. Five per cent of exports go to South East Asia, 4 per cent to Japan, 2 per cent to West Asia and 6 per cent to the rest of the world.

"This clearly shows that companies around the world can obtain competitive advantages through alliances with Indian software companies," says Nasscom's Mr Mehta.

In Europe, companies like Siemens of Germany, British Telecom and Deutsche Bank all rely on Indian software developers and the changes needed to prepare for the introduction of the euro are likely to expand the European market.

Nasscom's own research suggests that work related to the introduction of the euro could be worth more than \$2bn alone to the Indian software industry over the next three years - further augmenting the year 2000 conversion work which is currently under way.

The Indian companies undertaking this work are a diverse mixture of new start-ups, joint venture companies, foreign implants and spin-offs from some of India's oldest and most

India's top 20 software exporters

Rank	Company	1997-98	1998-99	Growth (%)
1	Tata Consultancy Services	9,401	9,008	554
2	WGL Corporation	7,300	-	-
3	Wipro	3,888	2,525	640
4	Pentaflex Software & Exports	2,717	1,594	704
5	HIT	2,683	1,812	800
6	Infosys Technologies	2,472	1,252	973
7	Satyam Computers Services	1,781	852	1,090
8	Tata Infotech	1,723	1,086	616
9	Pastel Computer Systems	1,375	848	620
10	Tata BNL	1,294	863	614
11	DSI Software	1,167	676	726
12	International Computers India	1,006	627	513
13	Mahindra British Telecom	882	627	580
14	LST Information Technology	880	-	-
15	Mastek	880	577	498
16	Chitrop Information Industries	751	532	470
17	Siemens Information Systems	720	563	363
18	CSC	682	342	935
19	HP India Software Operations	585	438	280
20	Complete Business Solutions	545	184	1,599
21	BFL Software	527	321	641

Source: Nasscom

well-established industrial groups.

According to Nasscom, there are almost 630 companies in India involved in software exports - another 160 small companies collectively account for revenues

Fourteen companies exported more than Rs1bn of software, while 73 companies had export revenues of over Rs100m last year

of less than Rs100m). Together, these companies employ about 200,000 software engineers, making the second largest group of software professionals in the world after the US.

However, these companies

vary dramatically in both size and structure. Last year, 14 companies exported more than Rs1bn of software and a total of 73 companies had export revenues of over Rs100m. Reflecting this growing stratification of the industry, the top 20 exporters accounted for almost 60 per cent of total exports.

These big exporters include companies such as Tata Consultancy Services which alone had software exports of almost Rs9.5bn last year - nearly 15 per cent of the industry total. As a result, Bombay-based TCS emerged as India's biggest IT company, the first time a software group has held this position.

Other top 10 software exporters include Bangalore-based Wipro Systems and Infosys Technologies, the Delhi-based HCL Group, Pentaflex from Madras and Satyam Computer Services from Hyderabad - India's fastest growing IT centre.

Most of these indigenous Indian software companies have emerged from existing Indian industrial groups, but the top 20 exporters list also

includes foreign joint venture and "captive" companies like IBM Global Services, Mahindra British Telecom, Citicorp Information Technologies, Siemens Information Systems and Hewlett Packard India.

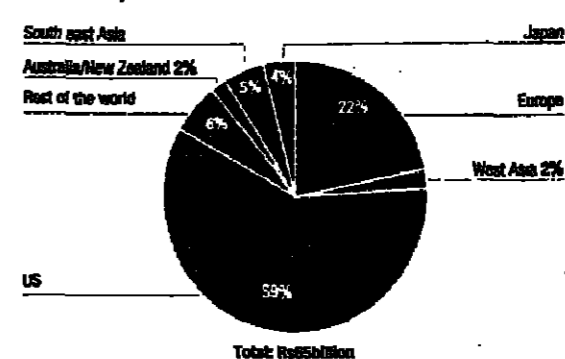
Typically local Indian software companies follow a similar development pattern as the move up the value chain. They begin by exporting cheap labour overseas or "body shopping".

This phase, which the Indian software industry entered in the 1980s, enables companies to build credibility with potential clients, and while margins in exporting cheap labour may be thin by international standards, low manpower costs mean exporters can still achieve healthy profits.

Secondly, they begin to bring work back to their home countries using cheap labour to provide offshore services. This type of contract or project-based work eliminates costly travel and helps build the local infrastructure.

In this phase, many Indian software companies have established

Software exports



Source: Nasscom

"software factories" or units dedicated exclusively to a single client. These high-security units - such as those established by companies such as Wipro, BFL and Madras-based Square-D - ensure confidentiality for long-term partners and operate as extensions to their in-house development teams.

For these companies, satellite communications remove distance as an obstacle to doing business. Six years ago, VSNL, India's international telecoms carrier, supplied just ten 64Kbps satellite data links. Now, Indian software companies have more than 500 leased lines capable of delivering 64Kbps or greater.

The shift from on-site to offshore work has been quite pronounced in the past decade. In 1990, the percentage of work done offshore was a mere 5 per cent. Today that figure has risen to about 41 per cent and continues to climb.

The next phase is to build packaged software products for export overseas, or provide high value-added services such as consultancy and systems integration. These are the highest margin businesses in the global software industry and the longer-term goal of most companies in India as elsewhere.

However, the packaged software business in particular requires more initial capital - which is in short supply in India - and is much more risky than contract work.

Successful products also require good market understanding and hefty marketing expenses which offset the cost advantages of developing software packages in a developing country.

Today, most Indian software companies undertake a

variety of work for their overseas clients - maintaining applications, converting code or migrating software from one platform to another. But increasingly they are also undertaking more challenging work for their overseas clients or par-



Sudhakar Ram of Mastek, one of India's top 20 software exporters, says: "So far, the industry has just scraped the surface."

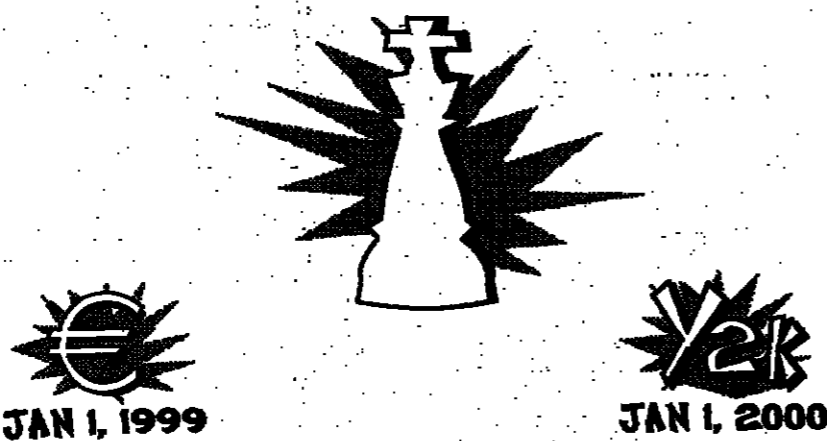
ents, including full-scale projects from design to testing and delivery.

Many of the larger Indian companies are also expanding their international presence. They are setting up offices in the US, Britain, continental Europe and now in south-east Asia and east Asia.

Government initiatives: see report by Mark Nicholson in Delhi, page 4.

Technology's impact on India: see report by Dewang Mehta, executive director of Nasscom on pages 4 and 7.

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INDIA: INFORMATION TECHNOLOGY

TECHNOLOGY'S IMPACT by Dewang Mehta

Rural India on the info highway

Millions of India's villagers who, as yet, do not have telephones in their homes, can nevertheless walk to the village phone booth and dictate Internet messages

Her face hidden behind a colourful veil, an illiterate woman stepped in front of a computer screen in a remote rural district of Uttar Pradesh, a state in northern India.

Chameli Devi was amazed when she saw and heard a message from her husband, Ram Singh, in the small public telephone office in Jaunpur last month. He had recorded it from a similar booth in Mumbai, 1,240 km away.

The couple inaugurated the world's first commercial video-email that will eventually enable millions of poor-illiterate people to communicate cheaply.

Costing Rs15 for a three-minute message, the facility transmits video images and the voices of users to e-mail accounts just like text messages.

Devi, who works in her fields and knows nothing of computers or electronic mail, paid the booth owner Rs10 extra to open a standing e-mail account, including her husband's picture that is stored on a hard disk at the

booth. Until now, Devi had to wait weeks for surface mail from her husband, whom she sees only for one month a year. The facility, likely to be launched in several public booths across India, will also provide video e-mail messages in local languages.

This e-mail facility was tested by inviting 18 Mumbai taxi drivers who come from Jaunpur to record messages for their wives and children back home.

The Government of India's information technology task force has suggested various means of propelling large numbers of Indians towards the global information revolution which has so far touched only a fraction of the country's nearly 1bn people.

Despite a boom in the use of computers, India has an installed base of only 2.3m personal computers and about 130,000 Internet subscribers, with each connection, on average shared by up to five people. The communications ministry has said it will provide all dis-



Dewang Mehta: Internet facilities will become widespread

tributed hubs across the country with Internet connectivity. Poor illiterate villagers, who do not have telephones and do not write letters, can now walk up to the phone booth and dictate Internet messages.

This is almost an Internet revolution. Thus not only the urban population but even rural Indians have started stepping onto the information superhighway. All of this is taking place under the backdrop of the opening up of Internet access in India.

The Internet policy announced by Atal Behari

Vajpayee, the Indian Prime Minister, last month is expected to unleash hundreds of private Internet Service Providers in India.

According to a survey conducted by India's National Association of Software and Service Companies (Nasscom), the country is projected to have more than 1.5m Internet subscribers by the turn of the century.

Undoubtedly, the software industry is ecstatic as more Internet proliferation would not only mean more business opportunities - such as Internet web designing, content development and e-commerce - but also more literacy and employment.

Today, there are more than 1,000 companies offering web design and content development services in India. These companies specialise in the latest technologies and are gearing up to transact e-business on the net. But for that, there is a need to introduce cyberlaws in the country.

New IT Act

India's department of electronics has done extensive work in drafting an Information Technology Act, which will be introduced in the Indian Parliament this month.

This will not only contain provisions for digital signature, but also amend outdated laws. Political observers believe the proposed Information Technology Act will have a smooth sailing in parliament as all political parties are in the favour of enacting cyberlaws.

The provisions of the Act are in conformity with the WIPO Copyright Act and the WIPO Performance and Phonograms Treaty. Legal experts believe that many provisions of this act are at par with the Digital Millennium Act, introduced in the

US Congress.

In yet another exercise, the government and the industry is also gearing up towards content development on Internet. Already, Nasscom is setting up a National Internet Centre of Excellence.

The objective of NICE is to create standards for Internet content for local languages and also to promote excellence in development of Internet web sites and databases. It would also undertake training of teachers.

Undoubtedly, India today houses the second largest English-speaking scientific manpower pool in the world. But, for a nation of almost 1bn people, only 4 per cent are proficient in English. Therefore, there is a strong effort to push Internet in local languages.

Proliferation of Internet in local languages may be more through cable television rather than a conventional personal computer. India has already seen a real proliferation of cable TV connections. If the installed base of personal computers in the country, is only 2.3m, then India boasts of 57m cable TV connections.

This is the second largest volume of cable TV connections in any country of the



E-mailing the world: In urban and rural areas, the public can dictate internet messages from public call offices

world. The cable TV industry has mushroomed largely due to its entertainment content, which has tremendous local flavour. For the Internet to proliferate in India, the flavour of local content and innovative methods such as video e-mail would have to be devised.

Cities such as Mumbai, Bhubaneswar, Pune, Hyderabad and Bangalore are laying fibre optic for cable TV so that consumers can gain access to the Internet by installing extra set-top boxes on their TVs.

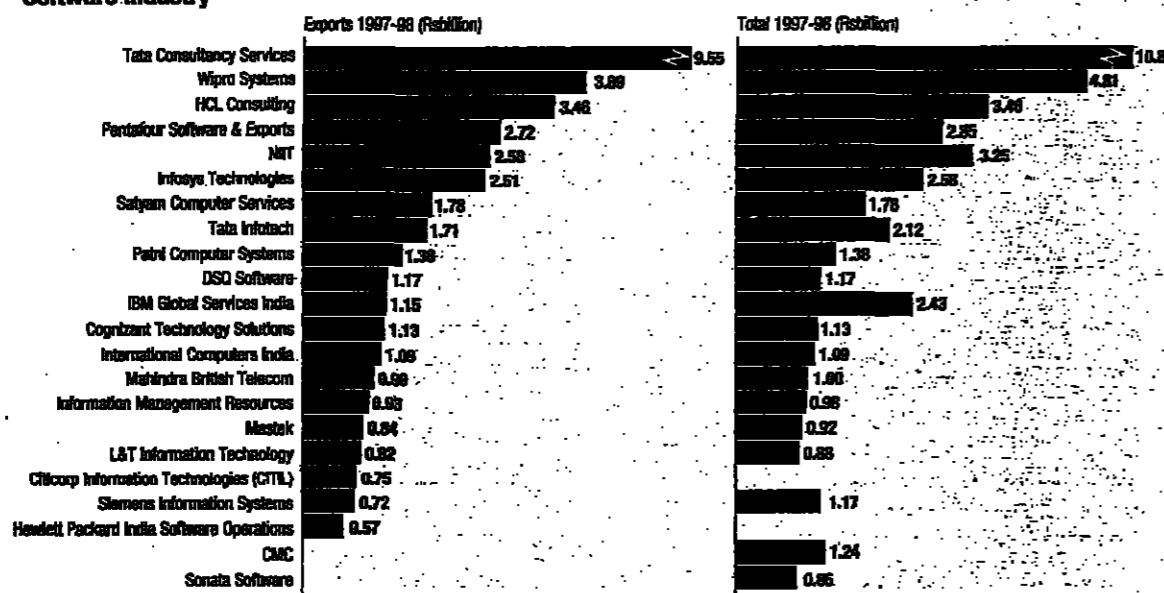
Experts in software industry believe that widespread

Internet proliferation in the country through unlimited number of ISPs would not only lead to a huge volume of e-commerce, but also to products and packages being developed in the country. In addition, the Internet could also be used for distance education through the concept of virtual universities.

For a vast country like India, the arrival of private ISPs, could not have been at a better time.

□ The writer is executive director of India's National Association of Software and Service Companies, Nasscom.

Software industry



GOVERNMENT INITIATIVES by Mark Nicholson

Task force cuts red tape to spur IT sector growth

The rapid growth of India's software market has been helped by the absence of bureaucratic interference and excessive controls

If there is a sense of momentum behind the Bharatiya Janata party-led government's drive to promote software and information technology - among its more successful initiatives so far - it is probably partly because there is no ministry of software and information technology.

Indeed, some of the software industry's pioneers have long said that the industry was helped to flourish in the late 1980s and since by the fact that it fell under no existing industrial or exporting licences or controls. None of India's dated, dusty and centralist controls anticipated the technological revolution which spawned the sector, no ministry was in place to constrain it with bureaucracy.

"If you look at two of the things India is best at, it is because there is no ministry," jokes Dewang Mehta, executive director of the National Association of Software and Service Companies. "One is our beautiful women, another is software. There is neither a department of software nor of beauty."

Thus, when the BJP-led government made IT development a priority, it was able to start more or less with a clear field. And the sector has from the outset been identified by the BJP as a priority. It was the sole party to devote attention to the sector in its election manifesto, partly a reflection of the fact that the success of India's software industry appealed directly to the party's strong economic nationalist agenda. The party speaks of making India an "infotech superpower".

Soon after taking power, therefore, and to create a change agent in the absence of any existing department, the BJP created a national task force on information technology.

This is an 18-strong body drawing together bureaucrats from appropriate ministries, politicians, including Chandrababu Naidu, the



Prime Minister Atal Behari Vajpayee launched the National Taskforce for IT and Software last May

"high-tech" chief minister of Andhra Pradesh state, and industry leaders. It is headed by Jaswant Singh, deputy chairman of the planning commission. Uniquely, the task force imposed on itself a series of deadlines for its reports and initiatives, and set itself an expiry date of December this year.

Constituted on May 23, it issued its first recommendations on July 5. These comprised 108 detailed recommendations embracing everything from moves to clear existing bottlenecks hindering the software and IT sector, promotional policies and guidelines for an overall national informatics policy, including full and liberal recommendations for an Internet service provider policy.

The whole was officially gazetted by July 26, and the task force has since produced a report on the hardware sector, while also being handed responsibility for reviewing India's overall telecoms liberalisation policy, a giant task and one which, say its members, derives from the "credibility" the unit has won.

Although not all that the

task force has recommended has yet become full-blown policy, nevertheless it has, by Jaswant Singh, deputy chairman of the planning commission. Uniquely, the task force imposed on itself a series of deadlines for its reports and initiatives, and set itself an expiry date of December this year.

Behind its success, say insiders, lies its relative nimbleness and energy. Though notionally 18-strong, the task force has been driven along chiefly by three individuals: Mr Mehta, whose industry lobby, Nasscom, is among India's best organised, N. Seshagiri, director of India's national informatics centre and a hugely experienced bureaucrat and Sudheendra Kulkarni, a former journalist and member of the prime minister's office, whose belief in India's IT potential borders on the messianic.

Throughout, the task force has had the full backing of Atal Behari Vajpayee, the prime minister, with whose authority, say insiders, Mr Kulkarni has wheedled, coaxed and organised various other government departments in behind the proposed IT policies.

"For someone so new to the system, he certainly knows how to work it," says a close observer. It has also helped that Nasscom has long had a well-articulated series of policy demands in place and upon which the unit could draw.

Thus, among the task force's gazetted recommendations, have been amendments to the depreciation rate on computers, from 25 per cent a year to 60 per cent, policies to allow "sweat equity" for software employees, moves to underpin greater bank lending to the sector, commitments to accelerate the duty schedule for all IT products, to make them all zero rated by 2002, a fully fledged and liberal Internet policy and various customs and export exemptions.

The unit has successfully pressed for Indian software companies for the first time to list on overseas exchanges, and to use foreign exchange to purchase companies abroad.

Not all these policies have yet been implemented. And the test of the BJP's IT drive will lie in ensuring that those policies whose implementation lies under the often dead hand of other government agencies are, indeed, effectively put in place.

The biggest achievement, however, according to Mr Kulkarni, is to have "created a certain atmosphere" of momentum behind IT in the country - and perhaps also within the bureaucracy. "It is in conveying to the nation that there is a big opportunity for India, that here's an area where India has a natural advantage and that we must not lose time. We are in the process of changing the mindset and ensuring the government facilitates and does not hinder the process. And we have to, at the same time, acknowledge that much that has happened in India in this sector is not because of the government, but despite the government."

Pedigree: *ped'i-grē, n.* a line of ancestors: a scheme or record of ancestry: lineage: genealogy: distinguished and ancient lineage: derivation, descent: succession, series, set. *-adj.* of known descent, pure-bred, and of good stock.

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INDIA: INFORMATION TECHNOLOGY

INDIAN SOFTWARE COMPANIES by Krishna Guha in Mumbai

Euphoria gives way to hard-headed assessment

As they move into increasingly complex and demanding areas, many businesses will have to develop more sophisticated management skills

One of the best performing business sectors in the world as just hit a pocket of turbulence. After rising seven times in value from the end of 1996 to mid-1998, India's leading software companies have fallen back by about 20 per cent.

This was despite excellent first half results. The big software houses reported profits up by about 85 per cent on revenues 50 per cent higher. Some doubled profits year-on-year.

There are a number of reasons for this. The spectacular rise in share prices earlier discounted much of the increase in profits.

Second quarter figures, set against a strong quarter last year, were not quite as impressive as some had hoped. Foreign investors took the opportunity to book profits, often to offset losses

in other sectors and other Asian markets. Meanwhile, the late summer fall in US high technology stocks listed on the Nasdaq exchange, a global benchmark for software shares, left Indian companies looking expensive.

Some investors sold software worldwide on fears of looming recession in North America, the biggest market for software exports. The correction did little more than blow away the froth around the sector. But it has had a sobering effect.

The initial euphoria is over, says Kishan Kanth, an analyst at DSP Merrill Lynch. "Everyone agrees that India's software companies still enjoy real competitive advantages," he says.

The debate is about whether, after rising seven times in value, the sector is

now fully priced. Leading Indian software companies trade at about 20 times next year's earnings, a hefty premium to the Indian market average of about 11 times future earnings.

"The price-earnings multiple for some companies is pretty high," says Alroy Lobo, an analyst at Kotak Securities. "That premium assumes strong outperformance. Other conventional multiples, like price to book value, also look stretched."

However, some analysts favour an alternative yardstick, price-earnings against growth, to take full account of software's faster growth rates. On this basis, software stocks look good value.

Investors are paying 20 times forward earnings for medium term growth rates of between 40 and 60 per cent, a P/E to growth ratio of 0.5 to 0.3, less than half the market average.

The result of this calculation is that software stocks which appear expensive today may look cheap in a

year or two's time. At this point, the sector may resume its upward march.

On both sides of the debate, analysts distinguish between an emerging super-league of big exporters and those companies which aspire to join them.

The top companies - including Tata Consulting Services, Wipro, HCL Consulting, Pentafour, NIIT, Infosys, Satyam and Tata Infotech - have established a presence in overseas markets, possess strong order books and are accumulating intellectual capital.

The biggest, TCS, is a global company in the making. However, it is privately held, a division of Tata Sons, the holding company of India's giant Tata group.

While periodic rumours suggest the group may one day opt for a public listing, there is no evidence that this will come soon.

TCS, Wipro, HCL and Infosys have made big strides in mainstream software solutions, developing



V. Chandrasekhar, president of Wipro Infotech, expresses confidence in the industry's future

expertise in client industries such as banking or retail.

Infosys and TCS have also made a little headway in selling software products. Others have developed niche markets. NIIT, for instance, is a world leader in education software and web-based learning. Pentafour earns half its revenues from digital animation, mostly for Hollywood entertainment companies.

Satyam has set up specialist Internet-based subsidiaries, and plans to act as an Internet service provider nationwide.

These are solid companies with good prospects. The most ambitious, including Infosys and NIIT, plan to list in the US as soon as market

conditions allow.

With greater ambitions come new risks. Many analysts feel a US listing could be a bridge too far and turn pale when told of plans for overseas acquisitions.

At the very least, greater complexity will put a premium on management skills. In many cases, indeed, they say, both in regard to potential and downside risk there is a strong case for saying these companies should be treated differently from the rest of the sector.

Setting aside unlisted companies and joint ventures such as IBM Global Solutions or Mahindra British Telecom, most of the remaining companies are fast growing but near the bottom of



Rahul Kanodia, joint managing director of Datamatics, one of India's leading software exporters

the value chain.

Most depend on basic systems conversion work, in particular the Y2K problem, for a larger chunk of their business than the big companies. This offers low margins.

At the lower end, software is more like a commodity business, says Mr Kanth. Companies have to market themselves on man-hour rates. Year 2000-compliance work will soon disappear, but fortunately there will be another big batch of conversion work as Europe adopts the new single currency.

However, what happens after the euro?

A lot of companies now growing at impressive rates may burn out. The best medium-sized companies may capitalise on their expertise and business relationships to graduate to more sophisticated business of the kind that India's top companies do today.

The reward for spotting winners within this investment universe will be huge. Valuations are relatively cheap and could jump if a company graduated to the big time.

The potential for these

companies to outperform is much greater in the future, says Mr Lobo.

There is scope for faster earnings growth and price-earnings expansion.

This is venture capital-style investing, high risk and high return. Even if investors spot a promising company, it may not have a solid track record and its shares may be too illiquid to trade.

Spectacular market returns for the bigger companies could be a thing of the past. Few analysts believe the sector can double or triple in value again in a matter of months, as it did before.

But the big software companies are here to stay and will remain core holdings for portfolio investors. For proof, it is necessary to look no further than the revised market indices published by the Bombay Stock Exchange and Morgan Stanley Capital International. Both for the first time include software.

Moreover, if the rupee begins to weaken again or signs of domestic recovery remain elusive, dollar-earning software could swiftly return to fashion.



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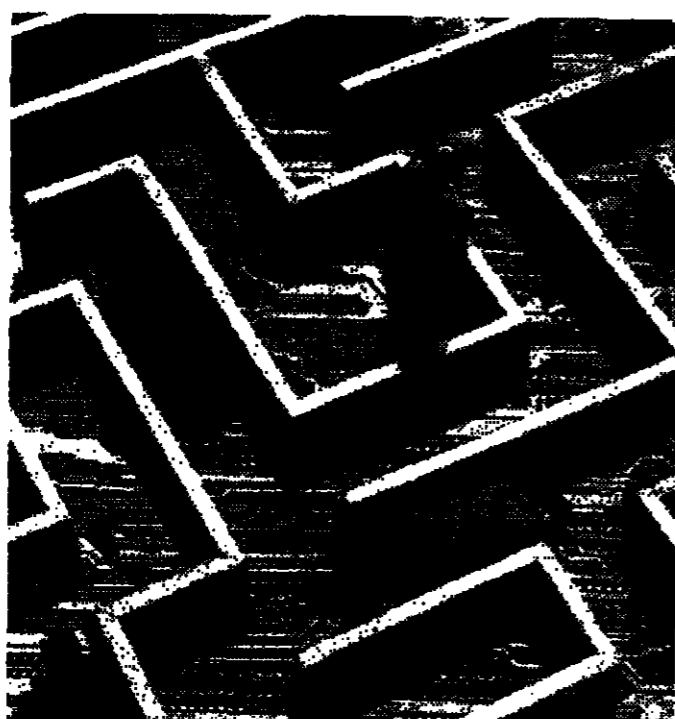
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INTERNET ACCESS

By Amy Louise Kazmin in New Delhi

Moving forward slowly

Conditions for Internet access in India are now more liberal than expected, but companies still expect problems

India's cyber-community waited for a year for the government to implement a cabinet decision to allow private Internet service providers, ending the monopoly of the state-owned phone company, VSNI, over access to the

cent foreign equity and can put up a bank guarantee for a prescribed amount.

So far, around 50 companies have applied for the virtually free 15-year licences to set up either on a national level, regionally, or in individual cities.

"This is a revolution - a real entry of India into the information age," says Dewang Mehta, executive director of the National Association of Software and Service Companies (Nasscom).

At present, local dial-up access to the Internet through VSNI is available in just 35 of India's thousands of cities and towns, which forced potential users elsewhere to make costly long-distance calls to reach the net.

But with the new policy, says Mr Mehta, "ISPs will be spreading everywhere". As they do, India's net surfing population is projected to grow from around 500,000 to an estimated 2.5m within four years.

While computer professionals revel in the policy, cynical telecom company executives, who have had bitter experiences dealing with India's entrenched telecom bureaucracy, are less enthusiastic.

While the policy appears liberal, they say that ambiguities in the licence agreements leave plenty of room for the Department of Telecommunications to wreak havoc with investors' plans.

"The devil is in the detail," says a senior executive for global telecom company planning to invest "really, really cautiously" in India's Internet sector.

He says companies providing other telecom services, such as cellular phones, have already learnt that the department has a way of zapping firms with unexpected costs and otherwise protecting their vested interests.

So as he lays out his plans, he is busy trying to discover "what bomb are they going to throw at us? What is not written in the licence agreement that is going to destroy the profitability of this business?"

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Datamatics software office in Mumbai has a dedicated data link to AT&T in the US

PROMOTING EXPANSION by Dewang Mehta

Sowing the seeds for future development

By moving swiftly to remove obstacles to growth and ensure wide access to the Internet, the government aims to help the IT sector into a new growth phase

This summer marked an important stage in the development of India's IT industry. Never before had the sector gained such extensive press coverage.

In the six months to November, not only were the seeds for the next stage of IT growth sown, but the quick implementation and follow-up also showed that the new government means business.

The latest IT drive is the brainchild of the new National Taskforce on Information Technology and Software Development. This IT Taskforce was constituted last May by Atal Behari Vajpayee, the Prime Minister, who gave it five major assignments.

The first, to be completed in 30 days, required the identification of bottlenecks in the way of India's IT development and the recommendation of measures to remove them. The second was the formulation of a draft of the national IT policy with the aim of enabling India to emerge as a leading force in IT over the next decade.

The third was to create an IT vision statement and awareness programme, the fourth being to set up a virtual vision group of eminent international and global leaders. The final assignment was to recommend a mechanism for monitoring and implementing the IT taskforce's recommendations.

The taskforce is headed by Jaswant Singh, the deputy chairman of the planning commission and a close associate of the Prime Minister. Other members include politicians, senior bureaucrats and industry representatives. The turn of the taskforce is currently intended to expire at the end of this year.

It submitted its first report - the IT action plan for the Prime Minister - in early July. This concentrated on the removal of bottlenecks in the IT industry and promotional recommendations.

Such ideas as providing Internet access through public telephone booths and cable television caught the people's imagination. The 108 recommendations of the taskforce were accepted fully by the government in July and even notified as law.

Yashwant Sinha, the finance minister, added to the positive spirit by announcing a wide ranging package of incentives for the software-driven IT sector.

He quickly implemented many of the finance-related recommendations of the

taskforce. Never before had any government in India given so much assistance at once to the software sector. One expert said: "It was like Santa Claus in the form of the finance minister giving goodies to the software sector."

The minister's package had a far-reaching effect on the software industry, as well as on the public. The government announced zero import duties on all kinds of IT software.

The government also extended a 100 per cent income tax exemption on profits derived from the export of IT enabling services. According to a conservative estimate by India's National Association of Software and Service Companies (Nasscom), such activities as medical transcription, data processing, revenue account-

company law. For the Indian software industry to become more oriented towards creating products and packages, an environment favourable to venture capital must be created.

Apart from working to create this, the government is also setting up four major venture capital funds with a minimum capital of Rs500m (\$2m) each.

The government also saw the need for more mergers and acquisitions in the software industry. Therefore, it has streamlined the process for Indian companies to make foreign acquisitions.

Among the major areas of importance for the taskforce are the Internet and telecommunications. A revision of telecoms policy is likely, as the taskforce is making its final recommendations to the Prime Minister this month. But in the meantime, based on the recommendations of the taskforce's first report, the government ended the monopoly of the state owned VSNL on pro-

ject to provide Internet access and PCs in every secondary school and college by 2003. This would involve more than 100,000 schools.

One of the unique programmes introduced by the government under the taskforce is to boost IT in rural areas. A pilot project has been introduced to network villages in the Warana Nagar Cooperative Complex in the state of Maharashtra. Also, to revitalize education in the Hindi-speaking northern belt of India, new schemes have been floated such as the development of the city of Allahabad as a centre of excellence for IT.

The IT Taskforce has also recommended a raft of measures to maximise the use of IT in government. These involve: each ministry or government department earmarking 1-3 per cent of its budget for IT; a fund of Rs7,000m to tackle the Y2K problem in computers in government organisations; and IT literacy being made an essential requirement for all future government and public sector employment.

Recently, the taskforce gave its second report to the Prime Minister. It suggested a series of recommendations to provide an impetus to hardware manufacturing, with the intention of making industry strong enough to meet the demands of a zero duty regime by 2003.

This report has proposed a new scheme known as Soft Bonded IT Unit (S-BITU) scheme. This is aimed at the integration of local and export production to maximise economies of scale by easing controls.

The speed with which the taskforce has acted, and also motivated the government to move fast, is virtually unprecedented in modern India.

One analyst in California said it seemed that the Prime Minister had not only used a big vacuum cleaner to sweep up all obstacles, but had also created a new IT vision for the country.

The IT Taskforce is now completing its final report, which is expected to be visionary. It has already set an annual target of \$50bn of software exports in 2003. Industry observers believe this is achievable, especially since past obstacles have been removed.

Bill Gates, the Microsoft billionaire, recently set up an research and development centre at Hyderabad, the emerging Silicon Valley of India. He said: "India has all the prerequisites to be a software superpower." India is determined to achieve this status.

The writer, Dewang Mehta, is executive director of the India's National Association of Software and Service Companies, Nasscom.

REGIONAL FOCUS
SALTEC, CALCUTTA

Good news for West Bengal

More cities are joining the country's drive to become a significant force in the sector, reports Kunal Bose in Calcutta

What Texas Instruments did for Bangalore, the south Indian city which has come to be known as the country's Silicon Valley, Computer Associates of the US is going to do for Calcutta's Salt Lake Electronics Complex (Saltec).

Bangalore stole a march over other Indian cities in the information technology sector after Texas Instruments established an export-oriented software unit there as early as 1984.

That was the first such venture in the country. The stamp of approval from Texas Instruments made Bangalore the natural destination for many foreign and domestic software units.

Now, an official of Bengal Chamber of Commerce says: "CA opening its shop at Saltec in March last put Calcutta [West Bengal's capital city] on the country's IT map."

Webel, the West Bengal government agency for IT sector promotion, the IT sector, says: "The quick consolidation of business here by CA and its ambitious plans for the Saltec unit are noticed by future investors."

CA's Saltec unit is a joint venture with the Chatterjee Group, an associate of Soros Fund Management. Yet another big nameplate that Saltec boasts is PricewaterhouseCoopers. "We are very happy with the quality of intellectual capital available in Calcutta," says Sanjay Kumar, president of Computer Associates.

"We have so far recruited 150 people for writing software and the team is being expanded. The joint venture, CATS, has nothing to complain about in the infrastructure at Saltec."

"We will be investing \$100m in India in less than five years and there is no



Crowds throng around Calcutta's famous Howrah Bridge

doubt that Calcutta will claim a major portion of that investment."

Purnendu Chatterjee, chairman of Chatterjee Group, says: "The principal reason why we chose Calcutta for CATS is the availability of excellent human resources."

"And, since the software industry has begun to grow here recently, it will be easy for us to retain talents. We will not have to contend with high turnover of manpower as is the case with companies operating out of Bangalore."

"My wholly owned TCG Software, which employs more than 100 software writers, is also at Saltec precisely for the same reason."

While the presence of CATS and PricewaterhouseCoopers is Saltec's strongest selling point, Bhuvaneshwar, the capital of eastern Indian state Orissa, will be looked at seriously by prospective investors following the opening of software development centres by Infosys and Satyam, India's two highly successful software groups.

According to the Information Technology Association of Orissa, the state's recently announced IT policy and the steps taken to make Bhuvaneshwar one of India's leading software cities have been noticed by IBM and Microsoft.

J. B. Patnaik, chief minister of Orissa, admits that "some states are far ahead of us in IT business. We cannot be equal to them overnight."

The state entered the IT sector only in the middle of 1996 and is working hard to make up for the lost time. The Orissa Industrial Infrastructure Development Corporation is to build a software technology park over 200 acres and a multi-storied software complex in partnership with a private investor.

It says the electronics zone of the export promotion industrial park, which will be close to Bhuvaneshwar, will be the "ideal location for hardware and software manufacturing units."

Orissa is aware that where Calcutta scores over Bhuvaneshwar is in the supply of high quality human

resources.

The state is taking steps to overcome this problem by creating the Indian Institute of Information Technology. It is negotiating with a US university for the opening of an offshore software training campus in Bhuvaneshwar.

"We want to create IT awareness among students at school level and the colleges in the state will offer graduation courses in computer science," says a government official. "It will be a different scene altogether in five years."

Orissa is not depending on big names alone for heralding the growth of software industry. "New entrepreneurs with good ideas and skills but without adequate money will have an important role to play in the IT sector," says an industry official.

"A state sponsored venture capital fund with an initial Rs150m (\$3.5m) is being created to support new entrepreneurs."

Roopen Roy, director of PricewaterhouseCoopers in India, says: "Webel needs to be restructured. It should be split into two separate companies, one to develop and maintain software park infrastructure services and the other to run a venture capital fund. Ideally, both the companies should have partners from the private sector."

Companies such as Intel and CA think India has the capacity to become "world leader in value-added software" and have decided to play the role of venture capitalist.

The challenge for West Bengal and Orissa will be to create the environment for new small software ventures to grow. Mr Chatterjee says the Marxist government in West Bengal jumped on to the IT bandwagon as it discovered the "tremendous job creating potential of the sector."

"But for West Bengal to gain leadership status in software development, it is essential to create a ministry of information and technology under a dynamic technology-savvy minister," he says.

"That will send the message about the government's intent and focus."

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INTERNET ACCESS

Telecoms links remain a problem

From facing page

says that Internet service providers will be allowed to set up their own gateways after obtaining "security clearance", telecoms officials have verbally stated that companies will not be allowed to re-sell spare gateway capacity.

That means smaller ISPs, which lack the resources or the need to set up their own gateway, may be required to go through the VSNL gateway rather than choose from all available options.

And companies with gateways may not be able to compete with VSNL for other business - something telecom companies say is crucial for viability.

The ill-defined "security clearance" could also be used to delay the establishment of gateways by VSNL's rivals. "What's the process? Who will do it? How long will it take?" asks Ananda Palwal, chief executive of Wipro Communications, an existing e-mail service provider which plans to offer Internet access. "It could be

a major deterrent." India's still weak basic telecom infrastructure will be another problem, especially at first. Private basic telecom service providers are still available in only a handful of cities and many others, including the capital, Delhi, suffer from a chronic shortage of phone lines.

Lines that are available are often of poor quality with plenty of static. That means potential ISPs may find it tough to get the lines they need so that customers can dial in.

"That will be the major constraint," says one telecom executive. Still, as Internet services proliferate, some analysts say it will unleash an uncontrollable force that will find innovative technical solutions to any shortcomings in the policy or its implementation.

Says IBM's Mr Sinha: "It is like an unwound coil. The minute you loosen one screw, it is bound to extend to the fullest extent beyond any rules and regulations."

(Additional reporting by Mark Nicholson.)

PAPERLESS SHARE SYSTEM by Krishna Guha

Electronic market brings sizeable efficiency gains

Investors are shedding their initial reluctance to give up traditional ways of dealing in securities, now that the advantages have gradually become clear

When India decided to set up a paperless share depository two years ago, a crucial step in efforts to modernise its financial markets, Tata Consulting Services was well positioned to bid for the systems contract.

India's biggest software house had already completed a similar project in Switzerland, where it designed the software for the Segal electronic share depository. Segal was a three-to-four-year project, with multiple deliverables and multi-systems, both back-end and front-end, says S. Ramadorai, managing director of TCS. "It gave us the confidence to bid for these projects on a global scale."

However, TCS was not an automatic choice for the Indian contract. The fledgling National Securities

Depository put out an open tender, inviting international companies to bid for the contract. TCS won against stiff competition from companies including Digital Equipment and IBM. The fact that TCS was Indian was the icing on the cake. But it was not the driving factor, says Chandrasekar Bhawe, managing director of the depository.

"We came to the conclusion that the best way to go forward was to buy ready-made, and we found the Swiss depository had the closest software to what we would need," he said.

The project brief had three basic components - the central depository system, the front-end system to be used by brokers and banks and the network used to connect them.



Dealers in Mumbai: new IT systems have strongly increased efficiency in stock market operations

Early on, the depository decided to piggy-back on the satellite terminal network recently set up by the National Stock Exchange for its trading systems to avoid duplicating equipment.

"We wanted to be operational fast," says Rajesh Doshi, executive director at the depository responsible for systems.

"We wanted a proven solution which could be adapted to Indian conditions, scalable so it could be expanded, and reliable."

The depository decided to take responsibility for commissioning all the front-end user software to ensure the market was ready to use the depository when it arrived. This would also keep the user cost down by spreading development expenses widely.

"We said we would give them a solution but they needed to pay for it," says Mr Doshi. So it had to be affordable for participants ranging from Citibank to a very small broker.

TCS proposed a solution based on a central IBM

mainframe, but using a Windows NT-Server system to link up with brokers rather than the IBM OS/2 system used by the Swiss depository.

"We changed the front-end piece," says Mr Ramadorai. He adds that the Indian arrangement was technologically superior and had greater functionality. It was also cheaper.

He says basing the Indian software on the existing Swiss solution helped to cut development cost and time. In the end roughly 70 per cent of the software was reusable.

This reflected the common core function. The underlying depository stores dematerialised information, says Mr Ramadorai. "It is purely a repository of all the information you want to store."

However, TCS had to redevelop about 30 per cent of the code. This section dealt with the way transactions take place, the regulations that apply, the type of participants in the market and the way stock is added and subtracted and fees are levied.

One big difference related to the fact that small investors play a much more active role in India's stock markets than in Switzerland.

Small traders and small investors account for about 85 per cent of transactions, says Mr Bhawe. By value it is probably 40 per cent retail. But, for the computer, entry value is immaterial - it is the number of entries that counts.

Thus India's depository had to be prepared for a much higher volume of much smaller transactions. At the peak, about 150 TCS programmers worked on the depository project and the basic system was operational in six months at a cost of about Rs400m (\$10m).

The bulk of the cost was hardware. Software cost about Rs100m. Participating brokers paid Rs300,000 each, recouping part, but not all, of the development cost.

The depository went live in November, 1996. Its systems worked. TCS remained actively involved and the depository later added more sophisticated functions.

But for a year, it struggled to win business as investors declined to swap easily traded paper shares for paperless transactions, for which there was little demand. It took a big education campaign and intervention by India's market regulator to set the ball rolling.

At the start of this year, the Securities and Exchange Board began to force institutions to use paperless shares to trade in popular stocks.

This finally triggered a rush to join. Investors signed up and began swapping share certificates for paperless shares. There are 100,000 accounts so far, with a volume of \$4bn to date and rising daily.

Continual need for fine-tuning

The sharp increase brought teething troubles. "Whenever we have encountered problems these have been of volumes," says Mr Bhawe. "You need constant fine-tuning of systems. A system is tested for a certain volume. If the volume goes beyond that, there may be problems."

However, bankers and brokers, a notoriously demanding group, have few complaints. The depository is now accepted as a secure and efficient system for settling institutional deals and retail investors are catching on.

Mr Bhawe says the application of information technology has brought big efficiency gains for the Indian stock market. Custody and transaction costs have been reduced sharply.

Buyers also benefit from stamp duty exemption. Brokers profit from a fall in processing costs and instant transfer, which reduces their need to finance trades with bridging loans.

The paperless market is cleaner and more secure than the paper market with its many forged and disputed certificates.

For TCS, the National Depository involvement proved the importance of building teams with industry experience and management skills as well as programming expertise in order to deliver a complex contract cheaply and on time.

"It is certainly a show-piece," says Mr Ramadorai. Since building India's depository, the company has won contracts to design the software for new electronic depositories in Malaysia and South Africa.



CASE STUDY REDIFF OF MUMBAI

Gateway to a vast array of online resources

The newcomer has already become the country's most visited web site

Intel, the world's largest semiconductor manufacturer, has been notably absent from the list of US technology companies, including other chipmakers such as Texas Instruments and Motorola, that have set up software development or design operations in India.

But, during a recent visit to India, Craig Barrett, Intel's new chief executive, agreed to make the group's first direct investment in India - a small minority stake of about 10 per cent in a Mumbai (Bombay)-based internet content start-up that plans to become India's premier "portal" site.

Rediff was set up two-and-a-half years ago by Ajit Balakrishnan.

"We want to be the ultimate portal site for Indians in India and overseas," says Mr Balakrishnan, who has assembled a team, including 15 journalists, to help turn his ambitions into reality.

The portal site, which has already become India's most visited web site with more



Founder Ajit Balakrishnan says: "We want to be the ultimate portal site for Indians in India and overseas"

than 650,000 visitors a month, provides its own news service, a free e-mail service and a home page creation service which enables users to construct their own web homepages without technical assistance. Other services include an

online job listing service which now lists more than 2,000 vacancies daily and which allows online applications. It also provides a gateway to the vast information resources now available on the web about India and is pioneering consumer e-commerce with an expanding range of transactional services.

These include an electronic music store featuring 40,000 titles, a bookshop with 100,000 titles, a Divai (Hindu Festival of Light) gift shop, film reviews and Bombay theatre booking service and online travel agency enabling visitors to choose and book hotels in India online.

"We want to build a scalable model based on both advertising and transaction revenues," says Mr Balakrishnan. So far, the site, built using IBM's Net.Commerce software running on Intel-based Pentium II servers, has 25 advertisers. He reckons 20 per cent of Indians overseas already log into the site. "Our goal is to have a 40 per cent share," he adds.

Paul Taylor

India's IT mantra

From page 1:

large pool of relatively low-cost, technically qualified and English-speaking software professionals that has underpinned its success.

An entry-level software programmer recruited by one of India's top domestic software companies can expect to earn about \$500 a month to start with, rising to about \$1,000 after three years and \$2,000 a month after six years.

As competition grows for the best graduates and engineers with experience, wages are rising rapidly and attrition rates have soared.

"India is facing a severe shortage of expertise and companies are struggling to keep people," says Rahul Kanodia, of Datamatics. "The biggest problem is at the project manager level."

"Wages have been rising at about 25 per cent a year for the past five years," says N. R. Narayana Murthy, Infosys' chief executive. On that basis the cost advantage enjoyed by Indian companies in the \$750bn-a-year global software market will erode quickly. Offsetting this wage inflation, Nasscom calcu-

lates that productivity is also rising rapidly, from about \$21,000 an engineer in 1992 to \$45,000 by 1996. As a result India is still very cost-competitive.

But most leading Indian software companies recognise that cost is not a sustainable strategic advantage. Instead, they have developed strategies which they believe will enable them to build their brands and move up the value ladder, either by delivering high quality customised services and consulting or by developing branded products for the global market.

Both strategies have their advantages and dangers. Most leading Indian software companies have already forged strong partnerships with their overseas partners and have shifted work offshore as the confidence of the customers has grown.

As a result the proportion of work undertaken for clients on-site has fallen from more than 90 per cent at the start of the decade to less than 60 per cent today.

Although on the face of it, India's share of the overall world software market appears tiny, some analysts

including those at First Global in Bombay, suggest that India's share of its real target market - support and maintenance and a small element of systems integration and application development - is actually around 5.5 per cent and will rise to about 11 per cent by the end of the decade.

This, coupled with a downturn in year 2000 work, could result in slowing growth, they suggest.

If this turns out to be true it is likely that it will be the smaller and medium-sized companies that are most dependent on basic computer services which will be hardest hit.

In contrast, some of the top tier companies are investing heavily in research and development and in particular in building software packages - especially in the banking, enterprise resource planning area - or developing software modules and components for use in other's packages.

"This is a high risk, high reward strategy," says R. Ravisankar, Citicorp Information Technology Industries' chief executive. "You cannot go half way."

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INFORMATION TECHNOLOGY

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Race to head off the year
2000 crisis: Pages 3-11

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Computer games
Developers seek a far
wider audience: Page 17

Doomsters have been having a field day with their grim warnings about what could happen when computer clocks switch to 2000 - but some of their forecasts have already started to come true.

Many companies are experiencing year 2000 (Y2K) software-related failures and quietly dealing with the consequences. This trend will gather pace, even though the new millennium is still more than a year away.

While much has been discussed about the potential consequences of hundreds of millions of computer clocks turning over to the 2000 date and triggering software failures, the fact is that Y2K failures are already becoming increasingly common.

The problem is straining information technology budgets and delaying the development of key business opportunities.

A survey by the Information Technology Association of America, a trade organisation, found earlier this year that 44 per cent of around 450 companies surveyed had already experienced Y2K-related failures in IT systems dealing with their day-to-day operations.

A further 67 per cent reported Y2K failures in IT systems under test conditions, demonstrating that fixing the software usually introduces new bugs that can only be discovered by comprehensive testing.

Y2K failures have not generally stopped businesses in their tracks, but awkward upsets have occurred.

"There have already been some high-profile Y2K system failures but companies don't want to admit they've had problems," says Ed Yourdon, chairman and co-founder of the Cutter Consortium, an IT consultancy in the US, and a leading expert on Y2K and IT issues. "We will see more of these types of failures over the next year."

Trigger for early failures

Such early IT system failures will occur more often as 2000 approaches, simply because IT systems generally look ahead in terms of forecasting sales, orders and other business functions.

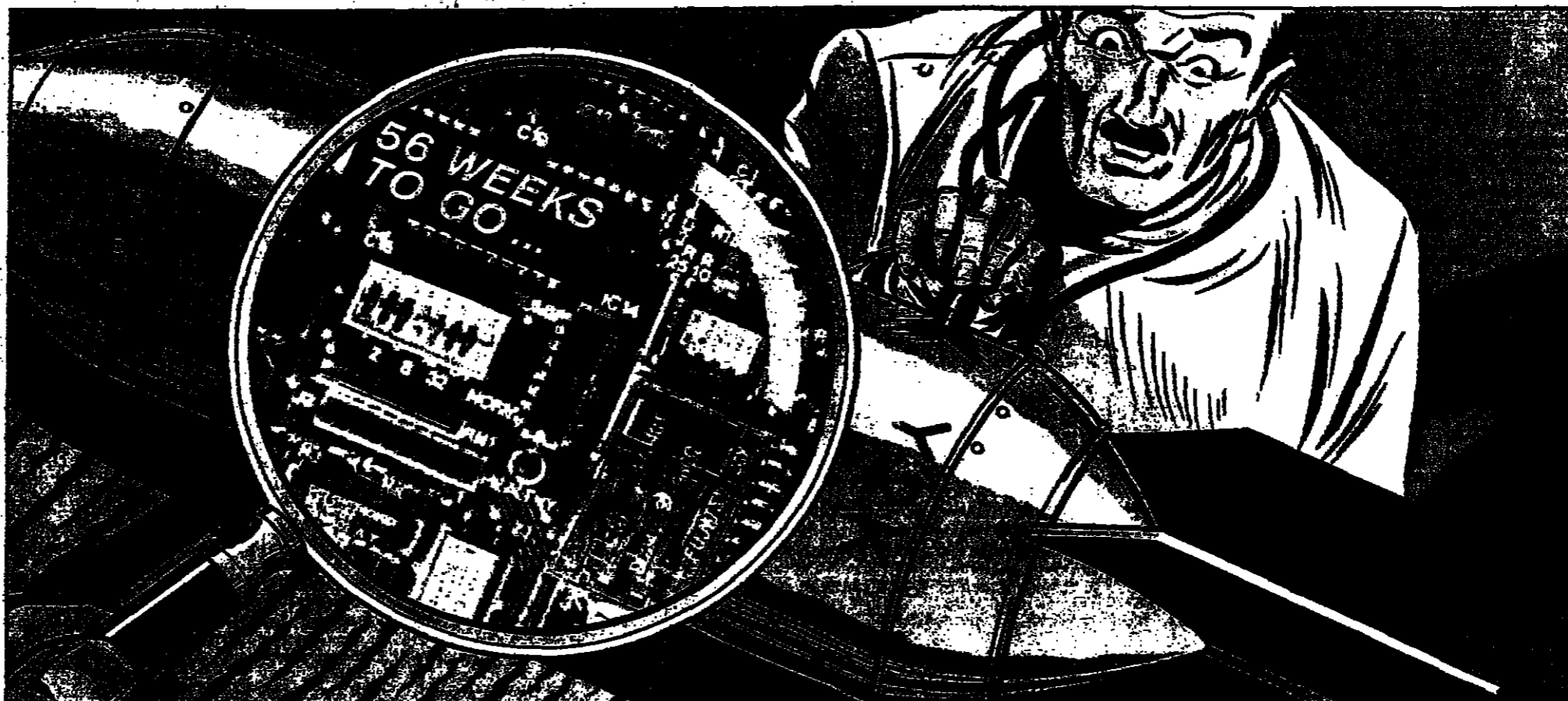
Gartner Group, the US IT consultancy, estimates that most user-developed applications will experience a Y2K-related failure by the close of 1998.

The rollover of company and government fiscal years will be another trigger for early Y2K failures. Next spring, the 2000 fiscal years of New York city and several US states, plus the government of Mexico, will begin.

"We will see very public Y2K failures," predicts Mr Yourdon. "Y2K failures during this time will give some indication of what private sector companies can expect."

With time running out, it is already too late for companies to attempt a wide-ranging overhaul of their IT systems.

"It was already too late to make major fixes by the beginning of this year," notes Capers Jones, an internationally respected Y2K authority and chief scientist of Artemis Management Systems of the US.



Many outside the IT profession have been hoping a 'silver bullet' will be developed that would easily fix Y2K problems, but IT professionals know such a thing is impossible

Illustration: Alan Thomas

Millennium 'bomb' is already ticking

The need to ensure that vital systems do not fail in 2000 is holding up other IT work, writes Tom Foremski

Mr Jones is recommending that his clients do what they can to implement Y2K solutions while making contingency plans for worst case scenarios.

Fixing older systems is time-consuming, and replacing them with new ones requires at least two years of planning, installation and testing. Yet Gartner estimates that 28 per cent of all US companies have yet to start work on Y2K.

Mr Jones, who advises governments on Y2K issues, says that the US and the UK are ahead of other countries in fixing their computer systems, with the rest of the world far behind.

Some economists, notably Ed Yardeni, chief economist of Deutsche Bank Securities in New York, have warned that Y2K problems have a 70 per cent chance of triggering a global recession.

Mr Jones says that with his best case scenario of 85 per cent of fixes completed in the US and the UK, "it puts us on the cusp of a possible recession".

He had advised the European Union to delay the launch of the euro, arguing that IT departments do not have the resources to tackle two of the most challenging IT projects ever encountered.

"The euro affects about 10 million software applications, but Y2K affects some 36 million software applications worldwide," estimates Mr Jones.

Usually about 15 per cent of IT projects are six months or more behind schedule. With Y2K the most challenging IT project of all time, many companies will not

complete their Y2K work in time. There are tools available for dealing with Y2K problems, but this is still a tedious job. "We have a tool that helps with Y2K but with 900 applications, we still need to go through each application and then test it to make sure there are no problems," notes Nadav Aharonov, systems analyst at the University of San Francisco. "It is a major job."

Many outside the IT profession have been hoping a "silver bullet" will be developed that would easily fix Y2K problems, but IT professionals know such a thing is impossible.

"A silver bullet is impossible to develop. There are hundreds of computer languages and a wide variety of systems," says Kazim Isfahani, industry analyst at Giga Information Group, an IT consultancy in the US.

Even if companies have been diligent and converted all their mission critical applications to be Y2K compliant, there are many other dangers.

Power and telecom services

"If the electric power grid fails, you won't know if you have a Y2K systems failure," says Mr Jones. And with an interlocked economy, a Y2K failure with a company's key supplier will create a significant problem.

There are also systems harbouring Y2K problems that many companies have yet to address. "Telecommunications systems are a potential problem,"

says Mr Yourdon. "Companies may have addressed their mission critical systems but haven't considered if their PBX is safe."

The extra spending on Y2K means that already hard-pressed IT departments will not be able to devote time to exploiting key business opportunities.

"We have found that most IT departments have stopped development of other IT projects so that they can concentrate on Y2K," says Mr Isfahani. "But electronic commerce projects have not been delayed. Most companies consider it a strategic project."

Mr Yourdon predicts: "By the middle of 1999, you will see IT spending on hardware and software drop considerably because IT departments will

want to stabilise their systems and won't want to install new systems until they know they can get through the date change."

Many IT vendors are already warning their shareholders that Y2K work will result in lower sales in 1999. "We think that our sales won't grow as fast in 1999 because of Y2K work within companies," notes Mark Nittler, vice-president of applications at US-based PeopleSoft, which provides software for large corporations.

Apart from the US and the UK, most other countries are way behind in their Y2K projects, either because they have not considered how important the issue is or, in cases such as Russia, there is no money for such work. And, with much of the world in economic recession, the lack of money makes Y2K a low priority.

While some may recoil at the doom and gloom scenarios for Y2K failures, others think it could turn out to be a relatively minor problem. In a 450-page report released earlier this year by Merrill Lynch - Y2K: Implications for Investors - the US investment bank's analysts claim that the majority of Y2K work will be completed in time.

"Most companies have been working on their Y2K projects for two years and there are one-and-a-half years left," the report says. "Microsoft, Latin America and Communism all changed radically in a lot less time."

The Y2K problem has its roots in the early years of the

computer industry when memory and data storage was expensive and required that programmers used two-digit date codes. By the early 1980s, this was no longer an issue, yet programmers continued to use two-digit codes.

"In many large organisations, including the Department of Defense, there were standards that mandated the use of two digit codes," says Mr Jones. "I know of instances of programmers using four-digit date codes who were told to rewrite their software because it did not comply with their organisation's standards."

Mr Yourdon says that although he warned in the early 1970s that two-digit date fields would become a problem, he only began publicising the issue in 1985. "Even in 1985, there was not much of an audience for Y2K issues."

One of the first programmers who tried to draw attention to the problem at an early date was Bill Schoen, a US software expert who has worked for several leading companies. In 1983, he developed the first commercial Y2K tool and spent several frustrating years making presentations to leading companies. Only two corporations bought the tool.

"If companies had begun using four-digit year dates in the early 1980s, you would not have heard about the year 2000 problem," Mr Schoen says.

"It would have been a trivial thing to use four-digit dates. It would not have cost anything in terms of labour or computer resources."

Such early preparations would have avoided most of the global cost of dealing with Y2K, estimates for which range from about \$500bn from Gartner Group to Mr Jones' figure of \$1,340bn. "Companies will effectively have nothing to show for this investment," adds Mr Yourdon. Mr Schoen is scathing about the IT sector's failure to tackle the problem in good time. "I am just a simple Cobol programmer, and I knew about the problem 20 years ago, and so did many other programmers."

"You have to ask the question, why didn't the IT gurus, the major IT systems providers, the IT standards organisations provide the early leadership that recommended that four-digit date codes be used?"

"We wouldn't be in this mess if they had."

On other pages

- IT guru's viewpoint: Peter de Jager explains why companies must show they have tackled the Y2K problem - or the public may panic: page 3.
- Impact on financial services: much work to do: page 4.
- Sectors at risk: pages 5-6.
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- Millennium stocks: high-flyers come down to earth with a bump: page 9.
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IT GURU'S VIEWPOINT: PETER DE JAGER

Spreading the good news about the year 2000

Companies must show how they have tackled the millennium problem and not be put off by lawyers – or the public may panic, writes Rod Newing

Peter de Jager was planning to pass the evening of December 31, 1999, in Dublin, "the best place for music in all of Ireland". Instead, he may spend the night on an aircraft. The reason is the need to spread some good news about the year 2000 problem.

"I am surprisingly pleased by the tremendous progress the US Federal Aviation Authority and the airlines have made," he says. "I intend to work closely with them over the next few months and if they convince me of some things, I will announce that I plan to be flying that night."

Mr de Jager, whose background is in mathematics and computer science, forecast some seven years ago the problems that would occur for computers when 2000 arrived. He has since become a leading guru in this subject. He strongly believes there needs to be some good news about the year 2000 issue.

"Now is the time for companies to say honestly what

they have achieved, what they have actually fixed and what remains to be done," he says. "Unless these achievements start becoming widely known, people will assume nothing has been done and there will be justifiable panic."

He is not expecting national electricity or telephone blackouts or that aircraft will be grounded everywhere. However, he does predict localised blackouts and the grounding of aircraft in some locations. He believes we have lost sight of the fact that the year 2000 issue was only ever going to be catastrophic if people did nothing.

"The reality is that, as late as we have started, a tremendous amount of effort has been expended," says Mr de Jager, who has worked as a programmer for banks, insurance companies and retailers, as well as for IBM.

"The CIBC bank in Canada alone has 1,000 working on the problem, which is good news, but at the moment there's no public evidence of

the progress made.

"It is time for the lawyers to shut up and get out of the picture. Boards must communicate what they have done by taking advertisements, holding public meetings, talking to the media and generally communicating the good news."

Mr de Jager is frequently asked: "Should I take my money out of the bank?" He says the banks have done a tremendous amount of work which must be communicated to their depositors, otherwise they will be nervous. And if they are nervous, they will take their money out.

Challenged over his use of the emotive word "panic" he says there will be disruptions and he advises people to prepare for the year 2000 in the same rational way Americans prepare for a hurricane or an earthquake.

All organisations must put contingency plans in place so that when unforeseen problems occur, business can continue. Customers and the public need to know they are not going to be affected and will continue to get service.

"It frustrates me immensely that I am now talking about contingency plans," says Mr de Jager. "A contingency plan is something you talk about when you have failed to solve the problem in the first place. Right from the beginning we had an opportunity to solve this problem and we chose not to do it. It is a sad commentary on both management and government."

Some 80 per cent of small businesses have not yet started to address the year 2000 issue, but that does not



De Jager: "It is time for lawyers to shut up and get out of the picture"

Illustration by Tony Healey

worry Mr de Jager. "Twenty-one per cent don't even use a computer and the rest use PC-based packaged software, which is easy to upgrade," he says.

Medium and large companies are different, because they have the problem of embedded chips. Mr de Jager expects embedded systems to cause problems, but believes that the number of failures will be very small. Unfortunately, they will be in areas with a large impact, such as in a chemical plant or on a ship.

Mr de Jager believes that all organisations will drop non-year 2000 projects next year – and that 40 per cent have already done so. Only 25 per cent of existing programmes are on year 2000 tasks and he expects the number to approach 100 per cent by the end of 1999.

"There can be no more new toys until we clean up

our room," he says. "The euro could be the worst thing Europe has ever done, not as a comment on the principle, but as a conflicting resource demand to the year 2000. It doesn't matter if it is delayed." At this stage, however, the euro's arrival is imminent.

People are finally beginning to realise how big and how serious the year 2000 problem is and are thus generating the momentum and motivation needed to fix it.

"A tremendous amount of work has been expended and we are making good progress," he says. "We are not going to get everything done, but it will not be the end of the world. Anyone who says that the year 2000 issue will not be a problem for their organisation is ignoring that fact that historically, 80 per cent of projects are delivered late or never."

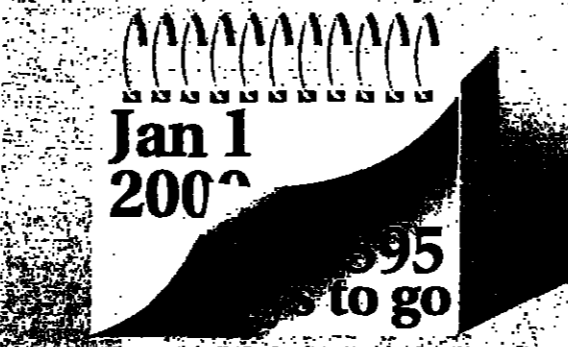
Many year 2000 managers he meets are displaying cautious optimism. They sound determined, but not too sure of themselves, and so are not complacent. They recognise the consequences of failure, which is a positive sign of a serious attempt at delivering their projects on time.

Mr de Jager believes that if the airline industry can convince him it is safe to fly, he will put an end to a lot of arguments simply by booking his flight.

"If I am confident enough that I will put myself on a plane that evening, then actions will speak louder than words," he says. "We need to communicate good news and I am willing to be part of it if I can."

□ Peter de Jager has created The Year 2000 Information Center (<http://www.year2000.com>) and its associated mailing list.

The Millennium Bomb - 56 weeks away



People are beginning to realise how big and how serious the year 2000 problem is and are thus generating the momentum and motivation needed to solve it, says Mr de Jager

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Production editor: Michael Wiltshire.
Editorial inquiries: for details of the FT-IT Review programme for 1999, see back page.

Writers in this issue (volume four, number twelve):
Andrew Fisher (andrew.fisher@FT.com)
Mike Wiltshire (mike.wiltshire@FT.com)
Paul Taylor (paul.taylor@FT.com)
Tom Foremski (foremski@compuserve.com)
Geoffrey Naim (gnaim@compuserve.com)
George Black (gblack@compuserve.com)
Philip Mansfield (p.mansfield@compuserve.com)
Jole Shillingford (jshillingford@compuserve.com)
Rod Newing (rnewing@compuserve.com)
Mark Vernon (mvernon@compuserve.com)
Michael Dempsey (mdempsey@compuserve.com)
Geoffrey Wiltshire (g.wiltshire@FT.com)
John Kavanagh (john.kavanagh@FT.com)
Nuala Moran (nuala.moran@FT.com)

Cover illustration: Mark Thomas
Graphics: Robert Hutchinson
Picture research: Patricia Lee and Matthew Glynn

The next issue: Wednesday, January 8. The main theme will examine the future impact of IT on business life in the coming decade.

For advertising details, contact:
Katharine Morton, tel +44 171 873 3746
Keeley Pope, tel +44 171 873 4885
or fax +44 171 873 3062
E-mail address: katharine.morton@FT.com
keeley.pope@FT.com

In US:
Tim Hart, FT New York, tel +1 212 745-1341
or fax +1 212 688 8229
E-mail address: tim.hart@FT.com

In Japan:
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or fax +81 3 3295 1264
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IMPACT ON FINANCIAL SERVICES by Geoffrey Nairn

Much work remains to be done

Increasing anxiety among bank customers could be more damaging than the year 2000 problem itself

The good news is that the financial services industry leads all others in preparedness for the millennium date problem - or the Y2K issue, as it is widely known.

The bad news is that much work still needs to be done if banks are to shake off the nightmare vision of long queues at the teller machines on the eve of 2000.

The banking industry, more than any other, is built on confidence. Recent events in Russia and other troubled economies have shown that a fall in confidence in the banking sector has customers rushing to withdraw their hard-earned savings.

Many banks are worried that the millennium "bomb" could trigger similar behaviour. The Federal Reserve, the US central bank, takes the fear very seriously and is prepared to pump an additional \$50bn in cash into the US economy at the end of 1999 to keep teller machines well stocked or allow nervous investors to liquidate their investments.

Industry experts insist such actions are unwarranted. "We do not recommend that you take [all] your money out of the bank," says Andy Kyte, Y2K analyst at Gartner Group, the IT research concern.

The banking industry is ahead of the curve in its Y2K

plans and customers should just keep their normal cash float," adds Peter Lawless, who heads IBM's Y2K initiative in the European financial sector.

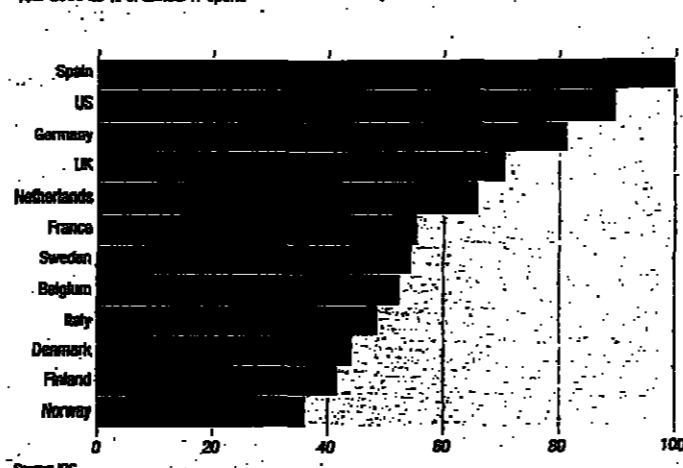
The financial sector is traditionally a stronghold for IBM mainframe computers, and the company knows it has a heavy responsibility in helping institutions to achieve Y2K compliance.

As well as making its own hardware and software compliant, it is also helping institutions to test their millions of lines of custom programs, many of which were written long before the Y2K issue was widely known.

But the Y2K issue affects more than just mainframes. Gartner Group knows of one bank with more than 12m lines of PC programs that have to be checked for potential year 2000 problems. Most are non-critical applications, such as word processors or spreadsheets, but Gartner has found several worrying exceptions, including one bank running its currency trading application on a PC spreadsheet.

IT managers in European institutions have the extra headache of the euro. The Bundesbank, Germany's central bank, recently said that the euro was getting priority treatment in Germany and that had obliged it to set a

Progress to date: how much has been spent Year 2000 as % of annual IT spend



relatively late deadline of July 1, 1999, for the German financial services industry to complete Y2K preparations.

The competing pressures on IT resources in the European banking sector will come to a head next year and push IT spending by European retail banks to a record \$21.7bn, according to Datamonitor, the British consultancy.

Beyond 2000, these levels of investment will not be sustainable, Datamonitor predicts. Spending will thus decline, although not dramatically. The drop in Y2K-specific expenditure will be partly compensated for by greater investment on large-scale integration work as the pace of mergers and acquisitions heats up in European

banking.

It was once expected that the Y2K problem would accelerate mergers and acquisitions when weaker banks realised they did not have the resources to fix the problem themselves.

"We know of banks in the US where the Y2K risk was one of the reasons for them merging," says Matthew Hotle, research director at Gartner.

However, the Federal Reserve moved earlier this year to dampen merger mania by warning that banks would not be allowed to merge if their Y2K projects were not well advanced. "We are now seeing a slowdown in mergers and acquisitions because banks are having to take the

Y2K issue extremely seriously," says Mr Lawless.

The millennium "bomb" has the potential to affect much more than just banks' cash machines, although this is usually the public's closest encounter with banking technology and malfunctioning teller machines will inevitably feature heavily in media reports on the first day of the new millennium.

"Anything that goes wrong at the beginning of 2000 is going to be blamed on the Y2K bug whether or not it's really to blame," says Margaret Joachim, European head of Y2K services for EDS, the IT services company.

The millennium problem could affect the financial services industry in ways that

are not easily apparent. Even though the industry has made good progress in ensuring its own systems are year 2000-proof, it could still suffer serious problems if, for example, customers were unable to meet loan payments because their own systems were down.

Analysts fear that widespread problems suffered by borrowers could have a serious impact on lending institutions, resulting in an increased frequency of defaults. Financial institutions thus also need to educate their borrowers about the importance of the Y2K issue.

The financial services industry is secretive by nature but government regulators are mandating banks, exchanges and brokers to meet myriad Y2K requirements and disclose information.

In the US, the Securities and Exchange Commission recently charged 37 brokerage firms for failing to report the status of their Y2K plans.

One of the biggest worries in the industry is containing the "systemic risk" that the Y2K problem potentially poses. The industry operates on a global basis with payment networks and trading systems closely interconnected.

Leading institutions know their well advanced Y2K plans will count for little if smaller institutions and less developed countries do not also take action.



During the countdown to the millennium, traders will have the added headache of wondering if their IT systems can cope

exchanges and brokers to meet myriad Y2K requirements and disclose information.

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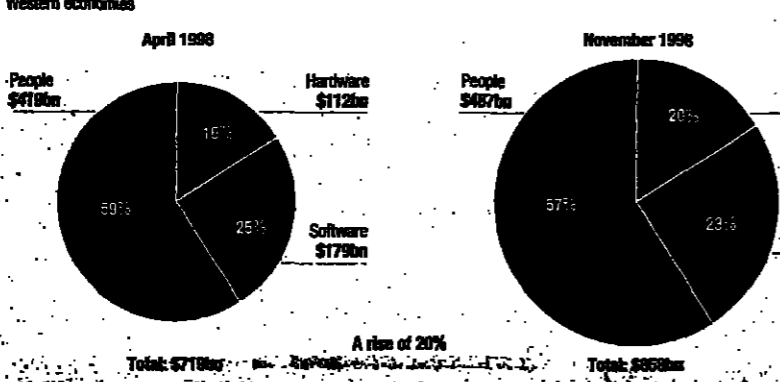
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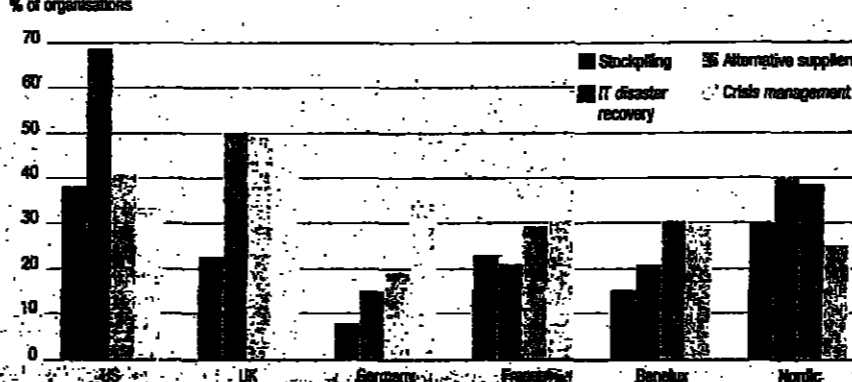
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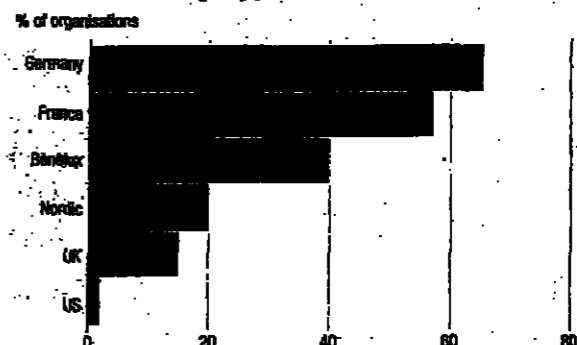
The rising cost of defusing the millennium "bomb" Western economies



Year 2000 contingency plans % of organisations



Year 2000: no contingency plans at all % of organisations



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SECTORS AT RISK by Geoffrey Nairn

Flying into the unknown

Only 10 per cent of 'critical' failures caused by the Y2K problem are likely to last three days or more

Will the sky fall in on January 1, 2000? Most Y2K experts think not. But while the worst prophecies of the doom merchants may not be realised, the consequences of the Y2K problem are difficult to predict as the level of preparation varies widely by company size, industry sector and country.

Much progress has been made in addressing the prob-

lem during the past year in the more developed economies. IT organisations in the US, for example, have increased their spending on Y2K projects an average of six times over what was spent during 1997, according to Gartner Group, the US consultancy.

Cap Gemini, the European IT services company, has tracked the preparedness of organisations in Europe and

the US through its Millennium Index report. The latest version, published last month, puts the cost of fixing the millennium bug at \$66bn and says more than half, \$49bn, has already been spent.

But despite a recent acceleration in spending and greater awareness of the issue, the battle is far from won.

"Even with all this progress, there are still serious risks for the US and throughout the world," says Lou Marocco, a Gartner analyst who recently testified to a Senate committee on the Y2K problem.

A recent Gartner report looks at the difference in Y2K preparedness in various countries. The most advanced are the US, Can-

ada, the Netherlands, Belgium, Australia and Sweden. Laggards include eastern Europe, Russia, southeast Asia, much of South America and, perhaps surprisingly, Japan. These all lag the US by more than 13 months.

Most of western Europe is six months behind the US, apart from Germany and France which lag by 12 months and eight to 10 months respectively.

Israel is ahead of its neighbours in the Middle East and lags the US by eight months. Although regions such as the Middle East and Russia are further behind than Germany and Japan, Gartner analysts expect the disruption to be greatest in the latter countries because of their economies' greater

dependence on IT.

The research was conducted over the summer when the Asian financial crisis loomed large. Many Asian economies have serious problems finding the financial resources to fix the Y2K problem.

"Enterprises with a high dependence on these countries for revenue will be affected economically," warns Gartner Group.

Some nations have managed to surge ahead of their neighbours in Y2K preparedness. For example, Mexico is ahead of other Latin American countries because its government has taken the initiative in raising awareness and promoting projects to reduce the risk.

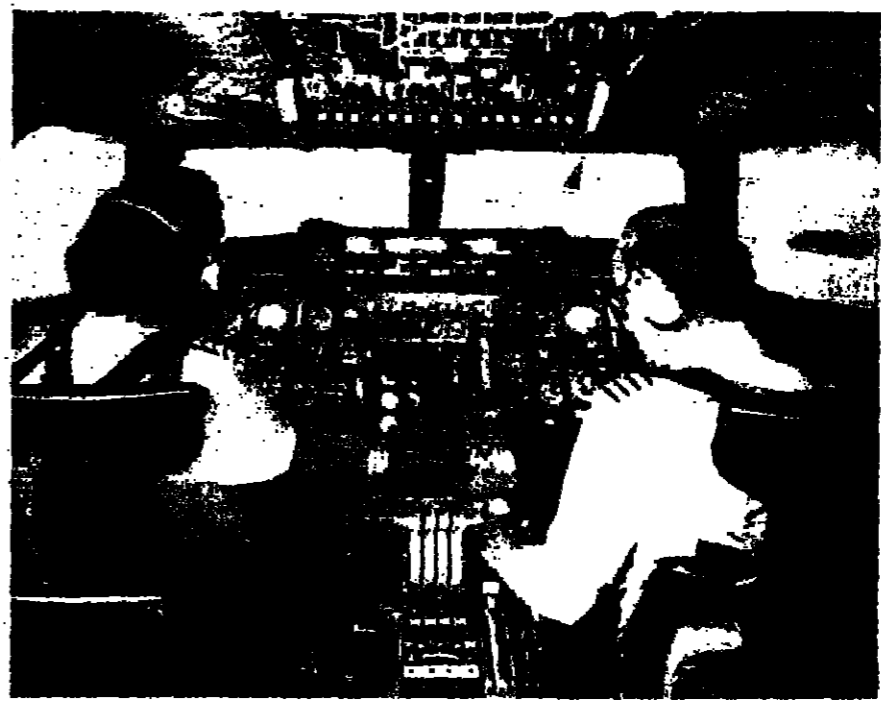
Mexican financial institutions and government agencies are subject to stringent Y2K reporting requirements. Other countries with positive leadership include Australia and the UK.

Within each country, there are wide variations between different companies, depending on their size. The Gartner survey of 15,000 companies in 87 countries revealed that 23 per cent had yet to start any Y2K effort and more than 80 per cent of these were small companies.

The survey also looked at the levels of preparedness in different industrial sectors.

The banking, investment and insurance industries are most advanced, while health care, semiconductors, food processing and government agencies are furthest behind.

Crucial sectors such as telecommunications, power, water and transport, which are heavily dependent on embedded systems, are barely ahead of



As the year changes to 2000, many people will prefer to remain earthbound

these laggards. This relative ranking by industry is also supported by Cap Gemini's research.

"It is no surprise that the finance sector is well ahead, but what is most concerning is the situation in health care and utilities," says Chris Webster, head of Y2K services at Cap Gemini.

The findings may seem to lend credibility to the "doomsday" predictions that aircraft could fall from the sky or power plants cease to function.

This is perhaps the most worrying prophecy, but Y2K experts see it as very unlikely, simply because the airline industry is highly safety-conscious and planes will be grounded rather than expose passengers to unnecessary risk.

Besides, airlines may have little say in the matter. "Many airlines and air traffic control systems are working very hard to fix their

systems, but these activities will be sidelined by the insurance companies," says Andy Kite, a Y2K analyst at Gartner Group.

Some insurance companies are understood to be considering withdrawing cover for flights over the New Year period. "And airlines cannot insure themselves," he adds.

In the electricity industry, the problem may be more real as generators cannot shut down their plants on New Year's Eve and slowly bring them up again the next day, which is the advice experts give to industries with systems that cannot be thoroughly tested.

One generator's Y2K problem could rapidly become a headache for all the others as the unexpected drop in capacity could put a strain on the whole grid. But this is much the same situation as when a bad storm hits a power grid and contingency plans ensure that any short-

fall is met and power quickly restored if a blackout strikes.

Perhaps the biggest Y2K question mark hangs over the public sector which in Europe, for example, accounts for 22 per cent of all IT spending.

"Most government agencies are significantly behind the US and extremely lagged overall," says Gartner Group.

Nevertheless, a few days delay in paying pensions or social security is unlikely to bring down a government and Gartner estimates that only 10 per cent of "mission critical" failures caused by the Y2K problem are likely to last three days or more.

The millennium problem must be taken seriously. But with suitable contingency planning, its effects on most people and businesses are likely to be limited to minor inconveniences rather than dramatic disasters.

Year 2000 readiness by region and company size

	No changes needed	Not yet addressed	Planned in progress	Completed	Total
US					
Small	15.6	46.4	31.3	6.7	416
Medium	17.8	25.4	46.2	8.8	192
Large	12.2	20.8	60.4	6.8	467
Total	14.5	31.4	46.9	7.1	1,075
Western Europe					
Small	30.0	33.7	34.9	8.4	3,088
Medium	20.9	29.7	48.3	10.1	1,115
Large	14.9	11.7	65.2	8.2	1,748
Total	20.5	25.8	45.1	8.6	6,072
Asia					
Small	17.9	52.4	25.5	3.2	1,057
Medium	11.2	42.8	38.5	6.5	430
Large	15.4	32.8	41.5	10.0	817
Total	15.8	44.1	38.9	6.3	2,304
All regions					
Small	21.4	38.8	32.6	7.2	6,294
Medium	18.1	25.7	46.1	9.1	1,728
Large	14.6	18.8	58.1	8.5	3,032
Total	18.9	30.8	42.7	7.9	10,054

* First data is based on annual revenue; small firms are those with revenue under US\$ 10-50 million, and large firms are those with revenue exceeding US\$ 50 million.

Source: Gartner

Levels of risk

Year 2000 exposure and compliance by sector

	Compliance	Exposure
Finance	High	High
Banking	High	High
Insurance	High	High
Air transport	High	High
Telecommunications	Medium	High
Manufacturing	Medium	High
Most government services	Medium	High
Energy	Medium	High
Shipping	Medium	Medium
Other government services	Medium-Low	High
Health care	Medium-Low	High
Retail trade	Medium-Low	High
SMEs	Medium-Low	Medium
Agriculture	Medium-Low	Low
Construction	Medium-Low	Low

Source: Gartner

THE BUDGETARY TIGHTROPE by Geoffrey Wheelwright

Cash battle for IT directors

As demand increases to update company networks, year 2000 budgets have the potential to become corporate battlefields

IT directors and chief information officers tackling the millennium computer date problem increasingly find themselves walking a budgetary tightrope.

On the one hand, they are being offered "whatever it takes" to fix the computer date problem and, for the first time, are hearing the phrase "are you sure that is enough?" when naming a cost for their Y2K projects.

Meanwhile, they are also facing strong boardroom pressure to make enhancements to other systems or functions within the corporate IT infrastructure to "leverage" the high cost of Y2K repairs.

Thus, year 2000 budgets have gained the potential to become a huge corporate battleground if IT departments are not completely scrupulous in their Y2K budget justifications. IT directors and CIOs - many of whom are also faced with the euro-compliance issue - can find themselves being asked to update entire networks instead of remaining sharply focussed on the year 2000 issue.

Mark Sokol, senior vice president of advanced technology for US software giant Computer Associates, advises extreme caution and suggests that IT directors and CIOs resist the pressure to use corporate Y2K projects to advance other agendas. CA is a leader in the year 2000 software sector and Mr Sokol himself has testified before US congressional committees dealing with the issue.

"It is so tempting to try and make other system changes when you are in there fixing data," admits Mr Sokol. "But you always have to pick the applications that are the most critical to your business and focus on fixing the problems that are most time critical - in this case Y2K."

And if you have to do multiple applications, try and do them in parallel with multiple pipelines at the same time. In some ways, it may cost more to do that, but it is generally less disruptive," Bill Etherington, IBM senior vice-president, concurs. He suggests that it will not be until several months into the new millennium that companies will really find out the cost and impact of the year 2000 date problem.

Mr Etherington admits this makes it very diffi-

The US leads the way, but is least confident

	US	Europe	UK
Progress to date	61	48	47
(Spent to date as % of total estimated spend)			
Confidence in solution critical systems	65	56	55
(% of organisations confident)			
Business continuity measures	55	50	55
(% of organisations adopting measures)			

Source: Cap Gemini

cult to budget and says that IBM is so concerned about the issue that he plans to be in his office on New Year's eve next year.

"I will be at work and most of our people will be," he says. "The difficult part with Y2K is that we have never tested all the systems in the world before. The technical challenge is not large, but the testing challenge is huge. My personal opinion is that we will get through it, but it will be a watershed event."

Moreover, estimates on the financial impact of fixing the Y2K problem are on the increase, making it hard for senior IT executives to estimate their costs accurately. In November, a study by the Cap Gemini group estimated that the total cost to major western economies (Europe and the US) of dealing with the issue had increased from \$719bn to \$86bn.

It suggested that, so far, an estimated \$49bn has been spent, with \$23bn of that invested in the last six months alone. Cap Gemini further found that of the \$23bn spent in the last six months, around a fifth had gone on hardware, a fifth on software and the balance on people costs.

In terms of individual corporate planning, however, it is probably more helpful to look at the a few examples to gauge how much Y2K repairs will cost. A recent requirement by the US Securities Exchange Commission to state the costs of Y2K projects is now making that research easier.

Last month, a number of large corporations filed SEC reports on their Y2K costs. One of these was fast food giant McDonald's, which reported that it had assessed its computerised systems to determine their ability to identify the year 2000 correctly and was devoting the necessary internal and external resources to replace,

upgrade or modify all significant systems which did not correctly identify the year 2000.

McDonald's stated that it expected to complete most of its necessary modifications and testing by the end of 1998 and to complete the replacement of systems as well as the remaining modifications and testing by the second quarter of 1999.

Despite all of this work - and that fact that the company does not expect the year 2000 issue to "pose significant operational or financial problems" - McDonald's says that "in the unlikely event" that McDonald's or a significant number of its key suppliers are unable to resolve the issue in a timely manner, there could be problems.

"Such matters could have a material impact on the company's results of operations," stated the company in its SEC report. "Contingency plans are being developed to address Year 2000 issues that might arise internally or within the supply chain."

McDonald's says it expects its total costs of dealing with the year 2000 issue for existing systems to be less than \$30m, of which approximately \$23m was incurred through September 30, 1998. The costs include internal modification and testing costs as well as costs associated with supply chain risk assessment and contingency planning.

It will also soon be easier to see what some financial brokers and dealers have spent on dealing with Y2K issues. The SEC recently amended the Securities Exchange Act of 1934 to require certain broker-dealers to file with the SEC and their designated examining authorities a report prepared by an independent public accountant on the broker-dealer's process for preparing for the year 2000.

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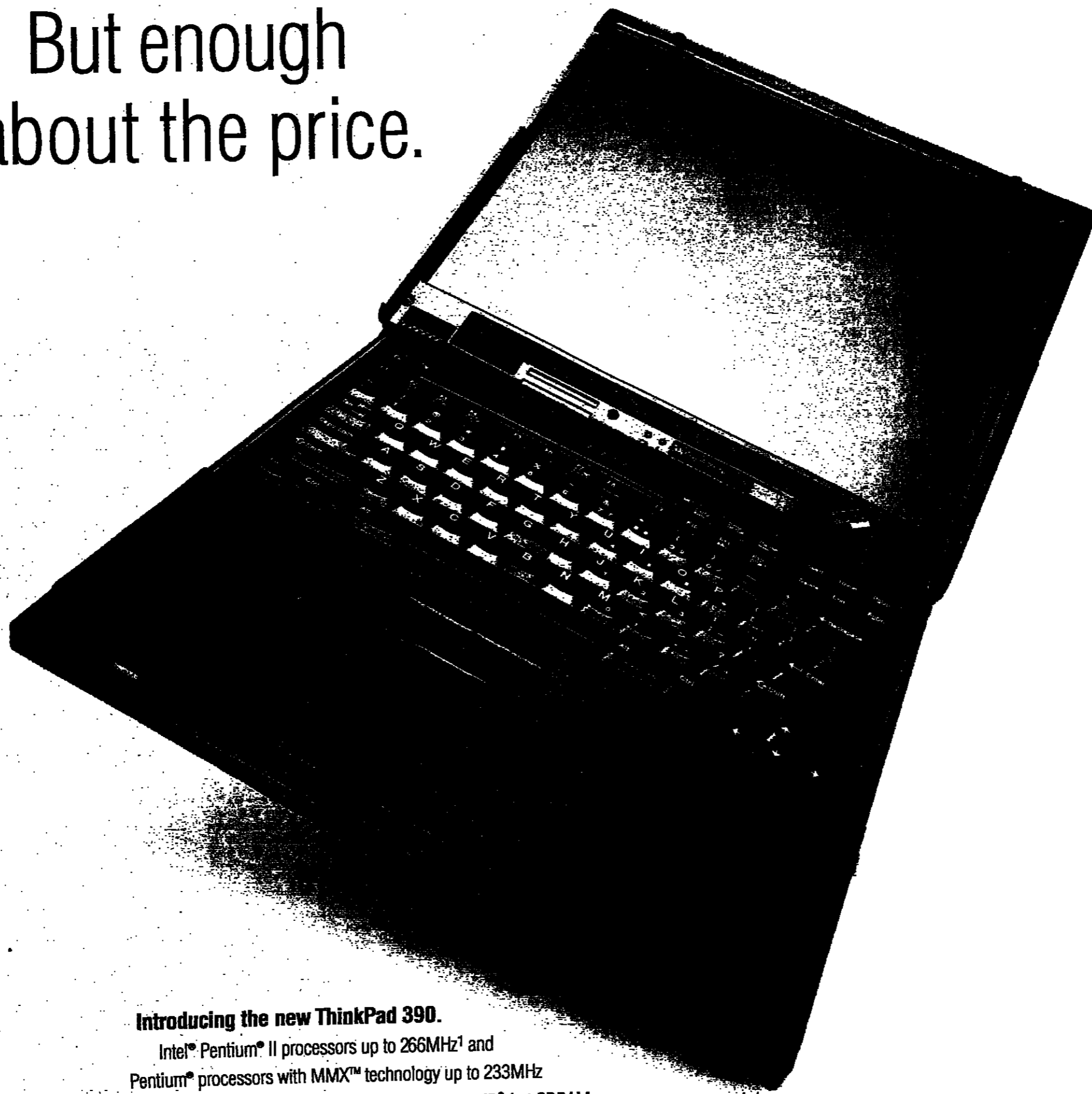
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INFORMATION SOURCES

Year 2000-related web sites

Among the many web sites related to the year 2000 problem are the following:

- Global 2000 Co-ordinating Committee: <http://www.globa2k.com/>
- World Bank web site: <http://www.worldbank.org/y2k/>
- World IT and Services Alliance: <http://www.witsa.com/>
- European Commission Y2K and the euro site: <http://www.ecp.cec.be/y2k/euro/>
- US Federal Reserve Board Y2K site: <http://www.bog.frb.fed.us/y2k/>
- Federal Reserve Bank of New York Y2K site: <http://www.ny.frb.org/banking/y2kindex.html>
- IS President's Council on Year 2000 Consensus: <http://www.y2k.gov/jaw/index.htm>
- German Federal Government: <http://www.bild.de/jahr2000/bericht2000/index.html>
- French Ministry of Economic Affairs, Finance and Industry: <http://www.industrie.gouv.fr/y2k/index.html>
- Bank for International Settlements: <http://www.bis.org/y2k/>
- Britain's Department of Trade and Industry: Action 2000: <http://www.bis.gov.uk/y2k/>

- www.bug2000.co.uk/
- UK Cabinet Office Year 2000 team: <http://www.open.gov.uk/year2000/>
- Tasdores 2000 in the UK: <http://www.tasdores2000.co.uk/>
- OECD website: <http://www.oecd.org/pubs/2000/y2k/index.htm>
- OECD year 2000 national links web page: <http://www.oecd.org/y2k/index.htm>
- Japan: Initiatives of the Prime Minister's Office: <http://www.kantei.go.jp/y2k/>
- Switzerland's Y2K Millennium Site: <http://www.millennium.ch/>
- Netherlands Millennium Platform: <http://www.millennium.nl/>
- New Zealand's Y2K Task Force: <http://www.y2k.govt.nz/>
- Italian authority for IT in the public sector: <http://www.sipa.it/attivita/anno2000/1/index.asp>
- Ireland's Civil Service, Finance Dept: <http://www.irgov.ie/finance/y2k.htm>
- Australian Government: <http://www.ogil.gov.au/year2000/y2000.html>
- Belgium's Millennium Forum 2000: <http://www.y2000.gov.be/index.htm>
- Canadian Federal Government: <http://www.bug2000.ca/>

- Portugal's Instituto de Informatica: <http://www.inst-informatica.pt/>
- Spain's "Map 2000": <http://www.map.es/csl/2000.htm>
- Mexico's Proyecto Ano 2000: <http://www.secodam.gob.mx/proy2000/>
- Swedish Millennium Commission: <http://www.2000-delegation.gov.se/english/index.htm>
- Denmark's Ministry of Research: <http://www.fsk.dk/>
- International Air Transport Association (IATA): <http://www.144.194.16.11/y2k/index.htm>
- International Telecom Union (ITU): <http://www.itu.int/y2k/>
- Gartner Group web site: <http://www.gartner.com/public/strat/home/home.html>
- International Data Corporation website: <http://www.idc.com/>
- SAP, the software company: <http://www.sap.com/y2000/index.htm>
- UK-based groups and web sites are also listed on the facing page.

Michael Wiltshire

MILLENNIUM STOCKS by Geoffrey Nairn

High-flyers come down to earth with a bump

Wall Street had big hopes for Y2K-related shares but the excitement has gone and prices have dropped sharply as the moment of truth approaches

The year 2000 has come and gone on Wall Street - at least as an investment theme - and it has left investors with a big hangover.

Software companies whose share prices soared in 1997 in anticipation of a boom in Y2K work, have seen market sentiment rapidly reverse and prices collapse when they failed to meet expectations.

Micro Focus is the latest in a growing line of Y2K-related stocks to disappoint. After seeing its share price treble in 1997, the software tools company came down to earth with a bump last month.

Martin Waters, the chief executive, announced "lower than anticipated demand" for year 2000-related products and services in its key north American market. Its share price fell to the level of 18 months ago.

When the Y2K issue first started to receive wide coverage two or three years ago,

financial institutions saw it as a golden investment opportunity. The problem is real and huge [and] the time for investors to buy is now," said JP Morgan, the US investment bank, in a 1996 research note on Y2K stocks.

Corporations and government agencies would have to spend \$200bn, one of the more conservative estimates, to fix the problem. Unlike other IT expenditure, the deadline could not be pushed back. "The year 2000 problem could account for all the forecasted worldwide systems integration services revenue through 2000," predicted JP Morgan.

It drew up a list of 30 or so stocks that it predicted would benefit most from year 2000 work and divided these Y2K "plays" into four broad categories: contract programming companies such as Amdahl and Data Dimensions, specialist Y2K tools suppliers such as Micro

Focus and Viasoft, traditional large systems integrators such as EDS or Computer Sciences, and a fourth set of companies destined to benefit in other ways, such as recruitment agencies.

However, few of JP Morgan's selections have lived up to expectations and a heavy exposure to Y2K work has become a mixed blessing for these companies as investors worry that sales of Y2K products and services could soon dry up.

Viasoft was traditionally seen as one of the strongest suppliers as half its revenues come from Y2K work. "Y2K revenue is not going to fall off anytime soon," says Steven Whiteman, Viasoft chairman and chief executive. But in October, it announced a quarterly loss and plans to lay off 10 per cent of its workforce.

Impact "Weaker demand and increased competition worldwide for Viasoft's Y2K software tools had a negative impact on first quarter results," says Mr Whiteman.

In mid-1997, at the height of the Y2K boom on Wall Street, Viasoft stock reached \$65. Last month the price collapsed to \$4.

Data Dimensions is similar in size to Viasoft - annual revenues for both are running at \$100m - and was also promoted as a pure play on the Y2K problem. An investment group led by George Soros, the billionaire investor, was one of the first to spot the company's potential and its share price soared by 400 per cent in 1997.

Data Dimensions' share price fell during early 1998 along with many of its competitors, but it has recently recovered following a set of quarterly results that exceeded analysts' estimates.

"Our year 2000 business continues to grow," says Larry Martin, the company's president and chief executive.

A few other Y2K plays are also doing well, including Tava Technologies, which recently announced record orders for its Y2K products and services, and Compuware, the large US software house.



Wall Street regulators have put pressure on listed companies to come clean about their year 2000 efforts



KEY BUSINESS ISSUES DISCLOSURE

Investors worried by companies' silence

Regulators are trying to force more companies to be open about their Y2K preparations, writes George Black

Boards of directors are coming under increasing pressure to detail their companies' responses to the year 2000 problem.

This follows a strongly worded pronouncement by the Securities and Exchange Commission, the US stock market regulator, in the summer.

Arthur Levitt, the SEC's chairman, wrote to more than 9,000 companies trading on the New York Stock Exchange and Nasdaq - including some leading European companies - insisting that they provide "thorough, meaningful disclosure on this topic" within the next quarter. He threatened legal action if they did not obey.

This demand went further than the request by the London stock exchange in

these, only 64 per cent estimated the cost of fixing it, says Graeme Farmer, assistant editor at Company Reporting in Scotland, which monitors annual reports.

"Very few companies give much detail and they are very optimistic in their brief statements," says Mr Farmer.

Costs which companies say will be involved in fixing it range from nothing to £100m. Few companies have discussed what impact these costs might have on their profit figures and few describe contingency plans for dealing with systems failures.

Some say that, although their own compliance programmes are in hand, they cannot vouch for their suppliers. Others say they are seeking guarantees from suppliers.

It is suspected that many companies are saying as little as possible on the subject because of concern that any statement could make them

liable and alarm shareholders about costs involved. To counteract such secrecy the US Congress voted for a new law giving legal protection to firms which share millennium bug information.

The intervention of the SEC raises the stakes. Companies are being forced to give a much more comprehensive explanation of their policies for tackling the bug in order to retain the confidence of investors and ultimately in order to continue trading publicly.

Recently the SEC fined 37 brokerages for failing to report their progress on the issue.

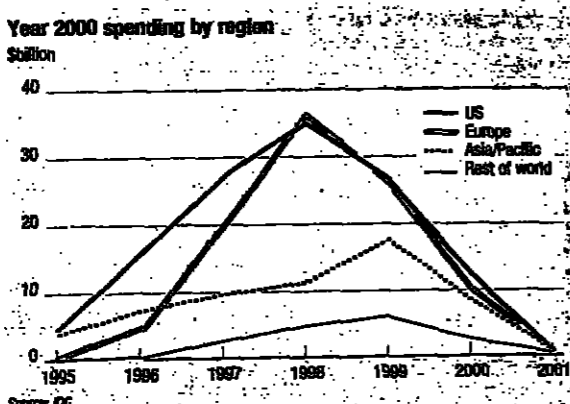
"There are going to be severe repercussions for companies that do not provide full disclosure fairly soon," says Andrew Rigby, partner in Tarte Lyons, the London law firm which specialises in the subject.

SEC rules require companies to be open about matters that affect liquidity, their capital resources and their trading operations as well as any matters which could have a material financial impact on their business.

It has identified the year 2000 bug as a matter which could have such a material financial impact.

Some companies have opted not to mention the issue in their reports on the grounds that they consider it will not have a material financial impact on them.

Turn to next page



Business continuity

What measures are organisations adopting?

Risk	US (%)	Europe (%)	UK (%)
Failure of essential services	67	55	57
Failure of networks/mainframes	72	58	63
Failure of IT systems	76	63	67
Failure of trading partners	66	55	67
Actions			
Stockpiling	35	19	22
Alternative trading partners	38	25	30
IT recovery services	41	32	45
Crisis management	33	31	42

Source: Cap Gemini

high quality
low cost
software development
off-shore/on-shore

Global

For details of the main themes to be covered by the FT-IT Review next year, see list on page 22 of this issue.

FT
IT

Themes for 1999

For details of the main themes to be covered by the FT-IT Review next year, see list on page 22 of this issue.

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LEGAL ISSUES by Joia Shillingford

Millennium failures could lead to claims bonanza

Lawyers can expect plenty of business, but companies should count the cost of suing their IT systems suppliers

Sending in the lawyers may not be the best way of getting your year 2000 problems fixed, according to Berwin Leighton, the City of London legal firm.

Ian Lowe, a partner, says: "Trying to get the supplier to pay for year 2000 work can mean you take your eye off the ball instead of getting the work done on time. At this stage, you should be co-operating with suppliers."

Mr Lowe's advice tallies with the policy of the UK government's Action 2000 initiative to help companies fix the so-called "Y2K" problem. It is encouraging companies to sign a no-litigation pledge and many, including Tesco, the supermarket chain, have done so.

Signing the pledge does not totally rule out later litigation, says Mr Lowe. "You should make it clear to suppliers by sending some sort of letter, that you are keeping your options open so that if, come 2000, you need to make a claim, you can still do so."

But the issue of going to law is finely balanced. It really comes down to cost. If the expense of fixing year 2000 problems is relatively small, this will probably be cheaper than the cost of legal pressure on the supplier. "If the costs are very large, it's worth looking at

the original supply contract," adds Mr Lowe. "But it is often not clear-cut whether there is any obligation on the part of the supplier. There are often exclusion clauses. Or the supplier will say 'we produce regular upgrades and year 2000 was always meant to be one of those upgrades'. It's hard to argue against that."

The issue of embedded microprocessors is potentially more fraught. These are not routinely upgraded and are intended to have a long life. Some people - especially in the construction industry - see 1995 as a cut-off point and are saying that anything bought after 1995 should be Y2K-compliant.

To date, there has not been a single year 2000 claim in the UK. "There have been a handful of cases in the US, including one where credit card readers in a supermarket could not read cards that expired after the year 2000," according to David Lawler of forensic accountants Bucher Phillips Lindquist Avery.

"Either Europeans are being pragmatic, or they don't want to divert the resources of their supplier," he says. "Or they have looked at the lead times for getting a solution from a rival supplier and decided to stick with the existing one."

That does not mean that UK companies are taking no recourse to the law. Some have drafted special contracts for their year 2000 contractors. For example, one supermarket chain has a contract with a built-in fine penalty (called a liability cap) which the computer services company it is using will have to pay if it defects to another client.

More litigation is likely in 2000 but it is hard to estimate how much. Nor will the lawsuits necessarily start immediately. "I see a period of grey, malaise at the beginning of the year 2000, while systems fail and people can't get into their offices," says Richard Lister, a Berwin Leighton partner.

Predictions

"There'll be three to six months of irritations in 2000, while people work out who they're going to sue," he predicts. "And there could be a flurry of claims just before the end of 1999, while people who haven't been able to fix their Y2K problems try the commercial litigation route."

"We are working with some companies to establish a series of trigger points when action might be taken if a supplier fails to fulfill actions critical to compliance."

In the US, the year 2000 legal climate is different. Law firms are expecting litigation in the trillions of dollars because of the year 2000.

They say courtrooms in Los Angeles are booked up for the next three years.

More mundanely, many US law firms are sending teams of lawyers in to their clients' offices to deal with the Y2K paper mountain - the masses of letters to and from suppliers, asking them whether they are year 2000 compliant. "They would only be doing that if they [the clients] were intending to sue later," comments Mr Lowe.

Some lawyers believe the level of paper-chasing on both sides of the Atlantic is excessive. Essentially, a blue chip company will send a letter containing binding legal clauses to 10,000 suppliers. But skilful suppliers can still reply in a way that shows they are responding to customers, but which falls short of promising anything.

Year 2000 warranties supplied with software and hardware do promise compliance. But even here, there can be a problem if products are supplied from the US.

"In the UK and parts of Europe, the BSI [British Standards Institution] Y2K conformity document has become the industry standard," says Mr Lister. "But when a European company is dealing with a big US software company it can be hard to move them away from their head office policy."

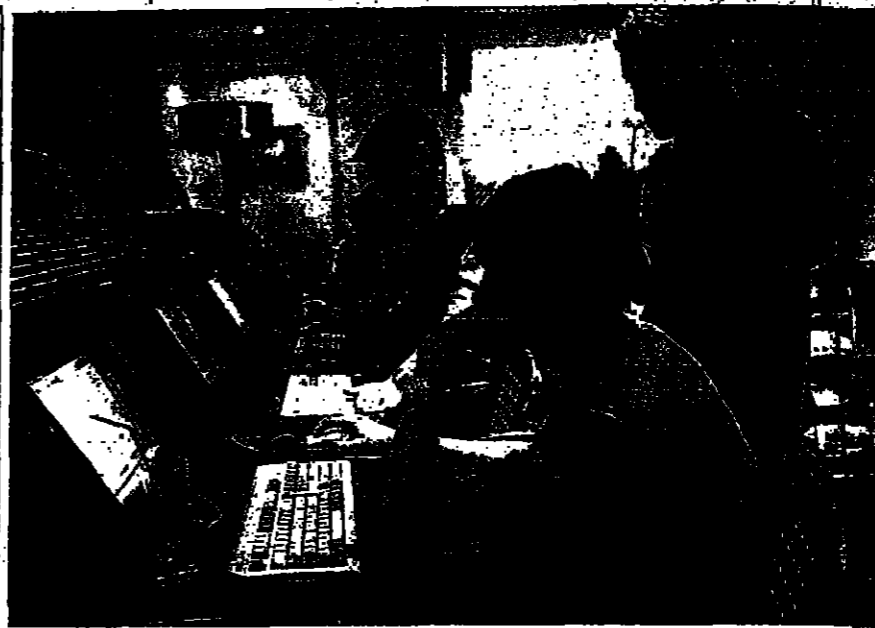
If all else fails, there is still litigation or, in some cases, insurance. Insurers are, however, wary of committing themselves to paying

out if products are not year 2000 compliant. But they may pay up if a company which has taken reasonable steps to ensure compliance still loses money due to business interruption stemming from year 2000 problems.

Similarly, UK household contents policies will not pay out if home appliances do not work, but may pay for consequential damage if, for example, a washing machine floods the home due to the Y2K problem. Travel insurers, too, would be reluctant to pay if, say, a plane could not leave the airport because of a year 2000 problem, but would still have to pay up if the aircraft exploded due to an unknown cause.

Mr Lawler, whose firm investigates and advises on business interruption insurance claims, expects most of the claims over the year 2000 to be for loss of profits. "There could also be cases of shareholders suing directors for failing to observe their duties as directors in respect of the year 2000. But some directors will be covered by directors' and officers' liability insurance if they can demonstrate that they have taken reasonable steps."

"In the US, a number of businesses have tried to sue their suppliers in advance. But so far, many judges have refused to rule in advance of the year 2000, because they can't predict what will happen." They are not the only ones.



Many Russians love using computers, with venues such as Moscow's Internet Cafe highly popular, but the government has done little to prepare for the problems of the year 2000



COMPLIANCE CASE STUDY NASDAQ

Why a tough US customer made early moves

Guaranteeing continuity of business will be the primary focus, reports Mark Vernon

Since its launch in 1971, the US Nasdaq stock exchange has expanded dramatically, now processing nearly 1.5bn shares a day, or 60,000 a second.

This equates to 1,200 messages per day - none of which must be lost, corrupted or delayed - and thus demands exacting performance and reliability from the exchange's information technology infrastructure.

"We have had to scale almost vertically," says John Hickey, Nasdaq's chief technology officer. "Above all, the technology needs to be there and be responsive."

"The markets come up every day. If there is a problem, we wake up the president."

Some 450 people work in the Connecticut data centre, the heart of the IT nervous system based predominantly on Unisys equipment.

Nasdaq is a tough customer, not only because of market expectations. In August, 1994, it suffered the embarrassment of a crash.

Even though systems were back up in 22 minutes, the collapse led to bad publicity for a year afterwards and still makes Mr Hickey shudder.

The company became aware of the year 2000 problem more than six years ago. Information about the millennium "bomb" was disseminated quickly throughout the financial services industry in a culture used to knowledge sharing on matters of universal impact.

The formal Nasdaq project itself began early in 1996 with the establishment of a management office. "The goal was to understand how to manage awareness of the problem both internally and externally, as well as how to manage the project itself," says Gregory Balar, executive vice-president and chief information officer for NASD, the Nasdaq parent company.

"We started then so that we could also be responsive to our responsibilities within the industry as a whole." He points out that NASD also

incorporates an arm that plays a regulatory role.

Senior executive sponsorship was established from the start. This ensured that the year 2000 issue was visible throughout the company and that awareness remained high.

Other mechanisms were put in place to inform the enterprise, notably a web site, clearly linked to the corporate intranet, from which project progress reports could be gained as well as more general information for external consumption.

Two distinct methodologies operated within NASD as a whole. In the Nasdaq division, the project was dealt with as part of the usual IT schedule which includes regular software upgrades and system tests.

This allowed costs to be carried within releases as well as building excellent internal knowledge of the issue.

Extra teams

In the regulatory division and within the parent company, additional teams were set up involving third party partners with internal staff dedicated to the project.

The problem was mitigated slightly for Nasdaq compared with others involved in the market, since certain date issues are not so complex for a service which closes every day. A portfolio manager, for example, has a more difficult task.

"However, we can recall virtually everything that happens on Nasdaq from our archive, and this requires date integrity to be secured across the millennium," says Mr Balar.

The project comprised a number of steps, beginning with an assessment of the size of the task and the best ways to approach it. "Impact analysis looked inside the code, though we found very few tools which were relevant to what we were doing or had been developed for the Unisys environment," he says.

Details of the methodology included establishing test parameters, processes to link

one remediation with the next, definitions of certification and governance, including regular reviews at board level.

"We also had to communicate with members and attend to our regulatory responsibilities," says Mr Balar. "This not only includes a hotline, but outboard calling to assess members' year 2000 status and that of their partners."

In fact, at the time of writing, this work is absorbing more project time than attending to code itself.

Testing was a crucial element with certification operating at three levels. First came the testing of individual applications alone, then the testing of whole environments, including databases and networks. It was only at this stage that compliance could be secured.

A third level of testing proved vital, too: the re-certification of systems to ensure that reinforcement had not occurred.

"About three months ago, we received a shipment of PCs which our retesting procedure found was not compliant in spite of labels declaring the contrary on the boxes," says Mr Balar.

Re-certification forms part of the contingency planning. From October, 1999, there will be a freeze on new implementations which will also free resources.

Contingency plans include assistance for members. "We want to help if a firm has a problem, too, to ensure the market stays up, so we are training in-house staff to go out on site should anything happen," he says.

Guaranteeing continuity of business will, in fact, be the primary focus for 1999. "This is an enormous amount of work which has to be galvanised around the world. It is a truly global effort," says Mr Balar.

"Rather like the space programme, the year 2000 has undoubtedly infused a significant amount of new investment in IT and witnessed unprecedented co-operation between parties. Its effects, beyond the bug, will be felt long into the new millennium."



What exactly is
IBM's {Position}
on Windows NT servers?

DISCLOSURE

From previous page:

"This will no longer wash," says Mr Rigby. The prospect is that stock exchange authorities around the world will follow the SEC and increasingly insist that companies make full declarations on the subject.

The SEC wants companies to state how much money and time they are spending on finding the bug, how far they have progressed and when they will finish, what their contingency plans for systems failures are and what effect, if any, is expected on their trading position.

Mr Levitt's letter made the authorities in some other countries, including the UK, look again at their position on extrajurisdictional statements.

The British government and the London Stock Exchange have been very concerned about the blandness of companies' statements and

have been considering what more they can do to induce disclosures.

"People want to know how seriously this is being taken by these organisations and what is being done about their external contacts," says Alan Cook, a director of the Accounting Standards Board.

As well as stock market authorities, regulators for particular market sectors may intervene to add to the pressure on company directors.

For example, the UK's Financial Services Authority has said it will call for an auditor's report if it is concerned about a financial institution's readiness.

The crucial period could begin in December, when many companies' interim reports are due. Investment analysts will be scrutinising the statements of boards on their strategy and will be posing questions at annual meetings if they are not

satisfied. They will not want to be surprised by profits warnings being issued due to higher year 2000 conversion costs than anticipated.

If investors do not receive replies which put them at ease, they could start to sell their shares. This could force companies to make statements in order to halt the selling.

Mr Rigby speculates that companies fail to quell the worries and selling accelerates, the stock exchange could ultimately be forced to suspend trading in their shares until the situation is sorted out.

By May, when there will be a large number of full year reports, investors will want to hear that the problems are all in the past.

It seems likely that through next year investors will increasingly make decisions taking into account who they trust to handle the year 2000 issue effectively.

د. محمد صالح المنجد

SOFTWARE 'FACTORIES' by Geoffrey Naim

Special help for those with Y2K computer date fears

Seeking assistance outside the company to solve year 2000 IT problems can save time and money, but it may not be the right solution for all businesses

With the millennium deadline looming and internal resources strained, many organisations are tempted to turn to an external "Y2K factory" to help fix their year 2000 programs. But as some have found to their cost, this option can create more problems than it solves.

At first sight, there are obvious benefits in delegating some or all of the Y2K remediation effort to an external contractor with a specialised centre, or "factory", dedicated to fixing millennium date problems. For example, some companies may not have sufficient IT staff for the task, or they may lack the specialised tools needed to inspect, fix and test code.

"One of the best ways to get around the resources shortage is to use tools to increase productivity," says Chris Webster, head of Y2K services at Cap Gemini, the computer services company. Cap Gemini has 21 factories that have renovated more than 300m lines of program code for hundreds of organisations worldwide.

The services offered range from checking and analysing the level of "date infection" in an organisation's programs right through to a fully automated renovation service. A Y2K factory, by definition, has staff with greater expertise in handling the Y2K problem and a variety of the tools needed to inspect and fix even the most esoteric programming languages and thus achieve higher levels of productivity and throughput.

By using an external factory, an organisation thus saves having to purchase its own Y2K tools and

having to train staff to use them. Another issue is that the impact of the Y2K problem is usually greatest on older "legacy" programs written by programmers who have long since left the organisation.

"Y2K requires you to make a significant investment in old skills," says Ian Baker, Y2K manager for IBM's European operations. Few in-house IT staff relish the prospect of looking for bugs in decade-old programs, so by offloading the Y2K work to an external contractor, internal staff can concentrate on more interesting work and the money saved on licences for special Y2K software tools can be used for more strategic purchases.

One of the principal benefits of using a Y2K factory is its formalised "factory-like" process that is ideally suited to the highly repetitive tasks involved in analysing and fixing millions of lines of program code. Experts say organisations with more than a million lines of code should seriously consider using a Y2K factory simply because of the problems of managing a project of this size internally.

Fingers can be burned on Year 2000 projects

"For this type of project, you need to be very disciplined, yet a lot of companies, when they try to do their Y2K work internally, do not treat it as a normal IT project," says Paul Gosling, European Y2K project director for US-based Unisys. "Y2K is a high risk project on which to burn your fingers."

Unisys has created a chain of 10 "migration factories" in various countries that offer an industrial-style specialisation of function similar to a conventional manufacturing factory and a set of well defined processes and disciplines.

One of Unisys' largest Y2K projects is for Abbey National, the UK bank; it centres around a software factory built and run by Unisys in Milton Keynes. This uses a highly automated production line with specialist work cells at each stage of the Y2K compliance process.

The project, which started in early 1997, involves 14m lines of code written in 16 different computing languages and should be finished for the end of 1998 at an estimated cost of over £20m. At its peak, 330 staff worked on this project.

IBM has created a network of 23 "renovation factories" around the world, of which nine are in Europe. The latter have completed 2,900 Y2K projects. Like several other players in the Y2K industry, IBM has sited some of its renovation factories in countries with lower labour costs, such as India, Belarus and Pakistan.

The "offshore" software industry was quick to spot the opportunity that the millennium "bomb" offers, as the cost of doing the labour-intensive tasks involved in Y2K work is considerably less in developing nations up to 50 per cent cheaper, according to some industry experts.

Offshore Y2K factories also help solve the year 2000 skills crisis as programmers skilled in older programming languages are in short supply in many developed economies. But some organisations that have sent Y2K work offshore have found it is not the cure-all that it first seemed.

"We have had to deal with clients who have sent program code offshore that comes back and contains quite significant flaws," says Mr Gosling of Unisys. He knows of cases where date references were missed in the original code – and these remained susceptible to the Y2K "bomb" – and where remediation work had been done badly.

Dealing with distant software houses

"Y2K work can be done well offshore but you really need to understand how to make it work," he says. There are special challenges in dealing with a software house that may be on the other side of the world. The most obvious one is managing the project and, in particular, the logistics of shipping code back and forth.

"The idea that you can throw code over the wall, fix it and then ship it back simply does not work," says Mr Baker of IBM. Another challenge is the security risk. The US Central Intelligence Agency fears that US companies, in their rush to fix the Y2K problem, are sending not only their bug-ridden code offshore but also commercially sensitive information.

The security and project management challenges are highest when using an offshore Y2K factory but they are also issues to consider when using Y2K factories located closer to home. Yet whatever the risks of using Y2K factories, some organisations may have little choice. With less than 13 months to go before the new millennium, analysts warn that those late to start Y2K projects may miss the deadline if they attempt to do it all themselves.

IBM

The real explosion of Windows NT servers has been at the departmental level – growing from the desktop up, connecting into larger networks, enterprise servers and legacy systems.

The growth of intranets, Web commerce and sophisticated custom apps built with powerful cross-platform software like Lotus Domino has fuelled the demand for powerful, reliable servers that connect thousands of users inside an organisation – from sales reps in the field armed with ThinkPads to desktop users in customer service departments. Servers like the Netfinity 5000 series.

These people also need access to the detailed information that resides on more powerful systems that are the core systems of a major enterprise (like, say, an IBM RS/6000 SP Unix server capable of processing millions of transactions a second) which means the ability to integrate departmental Windows NT servers into larger networks is critical.

Netfinity servers like the new Netfinity 5500 M10 help simplify this integration, with IBM Netfinity Manager software. It ships with every Netfinity server. It lets you manage clients and servers from dozens of leading manufacturers. And it helps you tie into enterprise-wide management software such as Tivoli Enterprise, Microsoft SMS and Intel® LANDesk.

This is what e-business is all about – not just building powerful servers for departmental use (and make no mistake, the Netfinity 5500 can handle everything from huge e-mail networks to 24 x 7 Web commerce), but providing tools to integrate and manage those servers as part of a much larger network. This, in turn, helps you control costs and keep your network up and running. That is the difference between an ordinary, everyday server and an e-business tool.

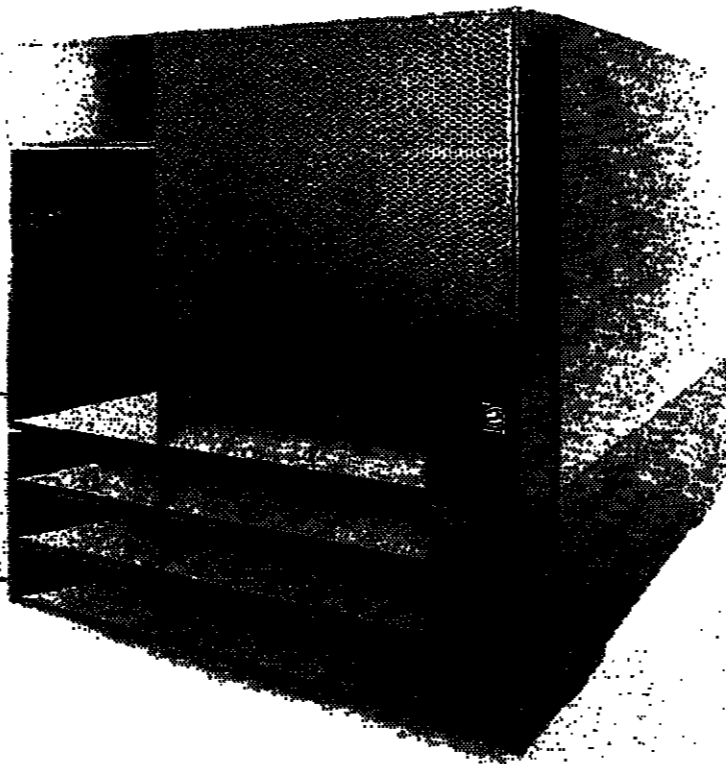
FACT: In the last two years, the use of Windows NT servers as departmental servers has exploded by more than 250 per cent. At the same time, more than 4,000 new applications have been developed specifically for Windows NT.

The IBM Netfinity 5000 series. Scalable servers for Windows NT.

Model shown, IBM Netfinity 5500 M10 Up to 2-way, Intel® Pentium® II Xeon™ processors at 400MHz. Up to 2GB interleaved SDRAM memory. Prices starting at £4,546* (ex VAT). The IBM Netfinity 5000 range starts at £2,086* (ex VAT).

@ e-business tools

In a windowless room on the { 8th floor } between sales and marketing.



Digital technologies allow more people to work from home offices. In the US, Barbara Casey, above, holds her son, Patrick, while working in her home office in Naperville, Illinois. A book by Sally Helgeson, called "Everyday Revolutionaries: Working Women and the Transformation of American Life" features Naperville as a "typical US suburb" and examines the stresses of working from home.

Equipment buyers spoiled for choice

With information and communication technologies converging rapidly, consumers face an exciting array of products and services, writes Paul Taylor

A digital whirlwind is reshaping the traditional computing, communications and consumer electronics industries. It promises unprecedented choice for consumers and business users in a new multimedia-rich world of information, education and entertainment.

Nowhere is this revolution more obvious than in the home and home office where the convergence of the "three Cs" is creating new opportunities and challenges both for the suppliers of products and services, and the users.

In particular, the distinctions between types of device – for example personal computers, set-top boxes and intelligent phones – are becoming blurred, as are delivery mechanisms including cable, wireless and satellite.

"Convergence of the IT, telecoms and broadcasting industries – made possible by developments in digital technologies – means that many different organisations are positioning themselves to provide multimedia products and services to the home and business," says Ovum, the London-based market research firm.

For the home office user, this means that a single PC can now function as a high speed gateway to the huge resources of the Internet for research, as an e-mail and fax communications tool and as a means to market and sell products or services using electronic commerce.

What is more, given the global reach of the Internet, the small business user can contact and conduct business with partners and customers on the other side of the world, just as easily as if they were on the other side of town.

Web-publishing software from Microsoft, SoftQuad and other companies makes it easy to create web pages and then upload them to an Internet Service Provider's hosting site. By adding a digital camera – which now costs little more than a traditional 35mm SLR – or a page scanner high quality images can also be added.

Setting up for e-commerce

Today, it is possible to set up a complete electronic commerce-enabled small office or home business using just a basic PC, modem and ISP account. Typically, however, a home office buyer should specify a machine with plenty of power and expansion capacity.

With PC prices continuing to tumble, a brand name PC complete with 366MHz Intel Pentium II processor, large 9GB hard disk and 56Kbps modem can be bought for \$1,000 or less in most markets.

A colour inkjet scanner will cost another \$150, although a growing number of home office users are opting to purchase multifunction devices which, for example, combine the operations of printer, fax machine, copier and scanner in a single machine costing perhaps \$300.

If large files are going to be transmitted, or lots of time will be spent on the Internet, most small business users should also consider investing in a high-capacity digital communications link. In most places in



In Hannover, Germany, a visitor at CeBIT, the world's biggest computer show, examines the keyboard of a personal computer. More than 7,200 companies exhibited at the event this year.

Europe, the easiest option may well be an ISDN (Integrated Services Digital Network) line supplied by the local telephone company.

ISDN lines can transmit and receive data at rates at least twice as fast as the fastest analogue modem. However, even faster options are just around the corner.

Among the high bandwidth technologies which are likely to be deployed over the next few years are cable modems and ADSL (asynchronous digital subscriber line) devices, both of

FT
IT

The small office, home office market

Here and on the following two pages, FT writers highlight advances in digital technology for the 'SoHo' sector

which offer substantially higher capacity than ISDN lines.

The launch of direct satellite services like the DirectPC service in the UK, which uses rooftop satellite dishes connected to PC-card adapters manufactured by companies such as Adaptec, provide another option.

These super-fast, digital delivery systems are capable of delivering broadband multimedia services including rich web content and high quality video-conferencing direct to the desktop, and they could have serious repercussions for existing distributors.

Internet telephony and e-mail are challenging traditional telecoms business models, while web television and "push" technologies are forcing broadcasters and information suppliers to reassess their strategies and embrace new technologies.

In the home, web television, smart phones and low-price computing devices such as set-top boxes and network computers could herald the arrival of the digital networked home. Ovum believes NCs are significant because they are part of the convergence between the TV and computer industries and

also because they enable new services to be developed. "NCs could provide the 'bridge' between the competing aspirations of the television and computing industries," says Ovum.

Digital radio and television broadcasting also represents an exciting new opportunity. Over the past two months, mass market digital satellite television has been launched in the UK and digital terrestrial television has made its world debut.

Some industry experts like Ed Straw, a partner with PricewaterhouseCoopers' consultancy practice in London, believe this could usher in a "platform war" between digital cable, satellite and terrestrial services. Each platform has its benefits and its drawbacks, he says. Overall, it could be an even race.

In the longer term, Internet or telecoms delivery is another potential platform competing directly, although the indirect competitive threat, in terms of competing for screen time, is already here, said Mr Straw.

Digital television

Nevertheless, most industry analysts agree that digital TV – delivered by whatever means – has enormous potential. "Digital television will change the way we shop, the way we bank and the way we use information and entertainment," says David Coverdale of Pace, the UK-based electronics group, one of the main suppliers of the set-top boxes required to receive the new satellite, cable and terrestrial services.

However, forecasts about the uptake of digital TV, which is already available in many parts of the world, vary sharply. According to the Digital TV Worldwide 1998 report, prepared by Market Tracking International, the global audience for digital TV is forecast to reach 55.5m by 2002, seven times the estimated 8.4m digital subscribers at present.

John Clements, chairman of Continental Research, the new media research specialist, writing in a recent report from Pace on UK consumer attitudes towards digital television, says digital TV offers a totally new form of TV in the future – "TV that goes beyond the bounds of entertainment into providing personally relevant information and opportunities. Post 2000, it will change the face of TV and the ways in which users interact with their TV sets." But he adds: "It will not happen overnight – it will be a gradual process."

More trouble

INTERNET SERVICES by Mark Vernon

A discerning eye is essential

Quality of service is the most important factor in selecting an Internet service provider for the smaller office

The hosted Internet economy is set for substantial growth, being projected to reach \$85m by 2001.

But today, it takes a discerning eye to see the wood for the trees when choosing which of the proliferating Internet Service Providers is best suited to provide anything from basic Internet access via a dial-up modem to a full service of out-sourced intranets and extranets.

It is, perhaps, the small to medium-sized businesses which have the worst of it. Without the benefit of long-standing, evolving relationships with large IT groups, they can be swamped in a sea of offers with few criteria upon which to decide which ISP can best support their needs.

One UK business, the Denby Pottery Company, first investigated what benefits the Internet could bring through a dial-up ISP account.

This minimal investment soon proved that the Internet was invaluable to the IT department for technical information, to the marketing people for researching customers and as a communications tool using e-mail.

But it also quickly became clear that upgrading the system to a leased line would be necessary to roll out the advantages across the company.

"We collated details of ISPs from the trade press and wrote to them with details of what we wanted,"

says Mark Allcock, technology manager.

"We wanted an e-mail system that integrated with our internal system, controlled web access for a few, a web hosting facility and remote dial-up connections for the sales team."

However, only a few ISPs replied with anything more than a standard information pack, which Mr Allcock immediately discarded. Some others tried to oversell services. A short-list was drawn up from the few which talked to Denby about what it wanted and submitted proposals.

Exploring the technical support these would provide was important, as was ensuring that they would not add hidden charges, say, for updating web pages. The company which designed Denby's web site helped at this point with mock out-of-hours support calls to the candidate ISPs.

"On these criteria alone, we were very quickly able to choose just one," says Mr Allcock. That was PSinet.

The important thing is to be professional in approaching ISPs and think carefully up front about what you actually want," he adds.

This point is taken up by Nick Gibson, Internet analyst at Durlacher, a UK research company. "For example, if you can survive without e-mail for say half an hour a day, virtually any ISP will do," he says.

"But if you need guarantees of up-time and speed,



Finding the best way to gain access to the Internet is not easy. Adequate support is vital for online business.

ISP," says Jack Manthorpe, multimedia editor for the London club. "But the site became popular and their rates were too high for the bandwidth we needed."

Mr Manthorpe assessed a number of ISPs in the market place to look for an alternative. These included VirginNet, with which the company already had a relationship for certain online activities.

Direct Connection won because they could offer guarantees to match the bandwidth demand. The fact that their hub is located in Telehouse, the main UK Internet exchange point, assisted performance.

Also, the ISP was willing to enter into a financial deal with Chelsea, under which each has links to each other's web services.

"There is still a substantial amount of money involved," adds Mr Manthorpe. "Chelsea is not short of cash."

All in all, quality of service is the most important factor in choosing an ISP. "Smaller companies are entitled to that too," says Nick Jones, an analyst at IT research firm Jupiter.

But some special considerations apply. "Don't be caught out by a large growth of traffic," he says. "Many ISPs provide a 'burstable' service (to cope with demand surges), but they may only pay for extra capacity at extra cost."

"Good relations with the ISP are vital so they can move with you as you develop the site. And beware of being charged for services which are free elsewhere."

SMALL BUSINESS COMPUTERS by Christopher Price

Tempting PC offers for companies willing to spend

The potential market is huge, but support and advice are essential in winning over smaller businesses

For Europe's small- and medium-sized enterprises (SMEs), there has never been a better time to buy a personal computer. Not only are prices continuing to decline, but manufacturers have also woken up to the potential of the market and have launched a series of initiatives designed to support businesses.

Analysts' estimate of the SME market for PCs in Europe vary, but the number of units sold last year was around 5m. This would indicate a market worth around \$8.5bn. PC suppliers' interest is, therefore, hardly surprising.

"The SME computer market is without doubt one of the most exciting areas for us," says Jan Gesmar-Larsen, president of Europe, Middle East and Africa for Dell Computer, the US manufacturer. Dell is currently selling \$2m worth of PCs a day in Europe, double the amount of three months ago; this accounts for a fifth of its total sales.

The company has taken the PC market by storm over the past three years by using the Internet to drive its direct sales strategy. It has now targeted the SME market as an area with strong growth potential, setting up a new virtual European service and support centre to underpin the initiative.

However, Eric Schmitt, an analyst with Forrester Research in the US, believes one of the key challenges being faced by PC suppliers is the demand by SMEs for greater support. "They see fewer and fewer differences between the various PC models and are putting more emphasis on advice and hand-holding."

For Dell, which has eschewed a dealer network in favour of direct sales, this could prove a distinct disadvantage, particularly as

SMEs are renowned for preferring to use local suppliers.

Mr Gesmar-Larsen believes the Dell business model is well able to deal with the situation, pointing out that 85 per cent of its customer queries are dealt with over the telephone. Customers can also deal with Dell through its web site, with the European version having recently launched a new service initiative.

He also disputes the amount of face-to-face hand-holding that SMEs require, arguing that a large proportion are buying their third or fourth generation PC and are comfortable with trouble-shooting on the web or by telephone.

Jacques Heynen, SME manager for the region for Hewlett-Packard, the US computer manufacturer, believes that the trend towards more support is not a reflection of SMEs' ignorance of technology, but rather a desire to be supplied with a solution to their computing requirements, rather than individual products.

"They are looking to us to provide the right tools for their business, not just the hardware."

HP launched a global initiative a year ago to target the SME market. Its Spotlight strategy provided additional training and support for HP dealers as well as the launch of products specifically aimed at the SME market.

In Europe, this meant providing additional resources to 11,000 out of the European dealer network of 60,000. The result has been a rise of 40 per cent in PC sales and 10 per cent in printer sales to SMEs. The Spotlight programme was based on the findings of a poll commissioned by HP to discover which barriers SMEs perceived as preventing them

from buying, or upgrading their, computer systems. Three key features emerged:

□ **Fear of obsolescence.** Many companies were reluctant to invest in new technology because of concerns that it would be quickly overtaken by developments.

□ **Need for solutions.** There were also concerns that individual technology purchases alone were not sufficient to provide the answer to a company's technological requirements.

□ **Proximity.** Many companies preferred to conduct business with local suppliers and were reluctant to become involved with suppliers at a distance.

To encourage businesses to buy the latest equipment, HP introduced "E-finance", a scheme which enables them to update their technology, either at a reduced cost or free of charge. HP also addressed the need for solutions by forming partnerships with software vendors to provide as many applications with the PC as possible.

Mr Heynen also points out that HP is able to offer SMEs an integrated package of PC, printer, scanner and fax.

Finally, HP has introduced its Brio range of PCs aimed at the SME market. Patricia Rubio, who heads the Brio division in the UK, says the range has been designed to be both price and product sensitive in order to address the wide range of businesses within the SME market. Thus in the UK, Brio PC prices start from as low as \$800 (\$1,000).

However, while low prices are good news for businesses, they are a worrying trend for the manufacturers. Forrester's Mr Schmitt says that the sub-\$500 PC is likely to be on US shelves before Christmas, with European prices likely to follow swiftly behind.

With greater support, more targeted products and lower prices, the outlook for SMEs looks likely to continue bright.

DANGEROUS DATES

More trouble ahead

From page 11:

not saying that the problem will not happen, only that it is very unlikely.

Even when 2000 has been reached, and the millennium "bomb" has been fixed or the damage undone, the hassle may not be over. Two after-shocks could be felt during the year.

There are both associated with the fact that 2000 is a leap year, though an odd one at that. The rule for determining whether a year is a leap year is that it is divisible by four, but not by 100.

Except for 2000. The extra test that should be applied is that years divisible by 400 are leap years, too.

The question is - how many programmers have realised this? Two scenarios arise for those who have not. First, February 29 might be skipped. Secondly, a computer which counts the days of the year to work out the date will read December 30 as day 385 and so believe that 31 December is January 1, 2001.

Mixed leap years have caused problems in the past. In 1996, a computer in an aluminium smelter in New Zealand shut the plant down

a day early at the turn of the year. The furnace solidified as the metal cooled inside them and cost the company millions of dollars to clean up.

The Belgian stock exchange suffered a similar embarrassment when trades were recorded on the wrong of carelessness, simply forgetting about leap years in system code. But it might be erroneous to believe that year 2000 fixes have dealt with the problem.

"The leap year issue should be a standard check and thereby eliminated," says Robin Guenier, director of Taskforce 2000, the independent UK advisory group. "But you can't tell where someone is going to miss it."

"Some inevitably will. The only thing that matters is whether these are important or not."

Once 2001 has arrived, the impact of rogue Unix programmers might be felt again. The ASCII representation of September 8, 2001, is 999,999,999, another possible end-of-file command or Unix's very own millennium "bomb" a few months later. Users must hope that Dr Marshall is right.

Taking a look into the

more distant future, 2038 is another year to watch. Some developers are already talking of the Y2038 bug.

The problem here is for any program language that counts time in seconds from January 1, 1970. This includes Unix and also others such as C and C++.

Some time in the early hours of January 18, 2,147,483,647 seconds will have passed since the counters began and they will flip back to zero as that is the largest number that can be stored in 32-bit systems.

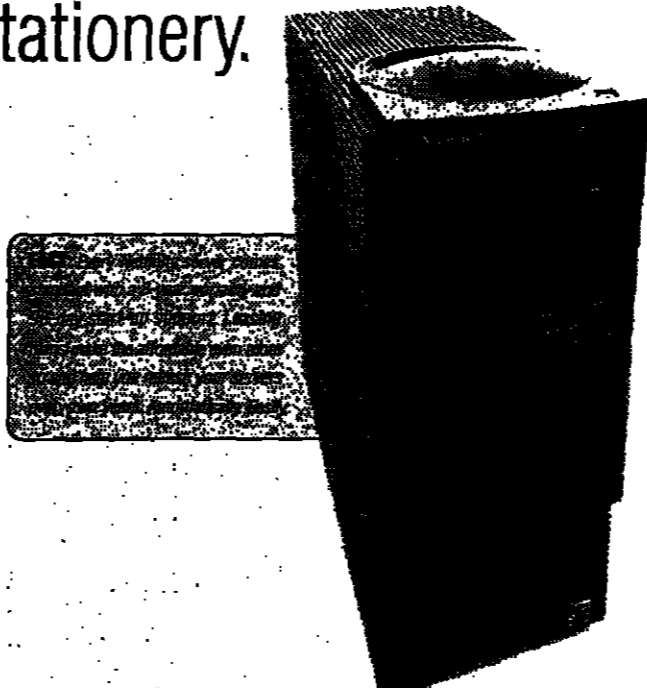
"This is a much harder problem," admits Dr Marshall. "One answer will be to have 64-bit machines by then."

Hal Hovland, of Financial Objects of the UK, has tested machines up to 2100 and noted that many would crash in 2038. "However, it won't affect calculations themselves," he adds, thinking of, say, long-term financial instruments.

"The IT problem only occurs when software is running on the date or beyond." By then, doomdates should be confined to the history books. But it would be wise to remember how the year 2000 problem arose.

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HOME NETWORKS by Philip Manchester

Online opportunity could prove to be 'a pot of gold'

Although the home has yet to become a networked zone, companies foresee lucrative prospects once the technology becomes cheap and widely available

The home is set to become the next target for networking technology. Research in the US predicts 35 per cent annual growth in the market for networking equipment for home use, and telecommunications suppliers are keen to exploit a potential bonanza in new services.

Forrester Research estimates annual sales for equipment and services for home networks in excess of \$1bn by 2002. "The home is the only place where networks have yet to make an impact - but it is only a matter of time," says Hyeon Lee, general manager of Lucent Technologies' residential networks group.

"The popularity of the Internet together with the desire of suppliers to bring services to the home will help to push networking

technology into this new space," she continues.

Certainly, home networking was high on the agenda at last month's Comdex conference in Las Vegas. A crowded session on the subject heard a succession of speakers from across the telecommunications and computer industries talk of a science fiction future where the home would become an "intelligent" component in the global network.

Dan Sweeney, business unit manager at Intel's home networking operation, noted that lower prices and easier installation would push the technology forward. "You don't need any new wires, it is simple to install and the cost is below \$200 per PC and falling. Early applications will be extensions of the PC - like shar-

ing a printer or shared Internet access."

Important elements such as standards and sufficient bandwidth were quickly falling into place and prospective home users had a range of choices for their home network "infrastructure", he added.

"You can extend the existing telephone line system, use wireless or even the AC power line system,"

Todd Green of Intelogis, a company specialising in using the power line system for home networks, pointed out that there were now 18m homes in the US with multiple PCs and this is expected to rise to 35m by 2000.

"Only 10 per cent of these are currently networked because traditional networking technology is too expensive and too complicated to install. We are aiming to lower the cost and make it easy to do," he said.

Intelogis sells a kit for about \$20 which plugs straight into a

PC and uses the domestic power supply as the network.

Today, it operates at 350 kilobits per second - but Mr Green claimed that his company would be able to deliver a two megabit per second version next year and aimed to push the speed up to 4 megabits by 2000. Other suppliers working in the same area include Echelon and Intellon.

Two industry groupings have emerged

While the design of the US power system is such that it can be used for home networking relatively easily, European homes are more likely to build their networks around telephone lines or wireless systems. Two industry groupings set up to promote the two technologies have emerged this year - the Home Phoneline Networking Alliance (HomePNA) for telephone-based systems and HomeRF Working Group

(HFRWG) for wireless. Both aim to create network connection standards to enable a wide range of devices to plug into a home network. HomePNA members include IBM, AT&T, Compaq, Hewlett Packard and Intel.

HFRWG members include Intel, Sony and Matsushita. A draft specification for the Shared Wireless Access Protocol (SWAP) standard is due to be published by the end of 1998; the first devices to use the standard are expected in the second half of 1999.

Regardless of the underlying technology, all of those involved share a single vision - a home network that knits together the proliferation of digital devices now common in every home. This could mean, for example, that an individual could telephone home and turn on the central heating system or the oven.

At a more mundane level, early applications are expected to include shared printing and stor-

age or simultaneous access to the Internet from two PCs on one telephone line.

Lucent's 'residential gateway'

Ms Lee of Lucent, for example, says her group is working on an experimental system to provide a "residential gateway" to the telecommunications system.

"Lucent has a number of projects under way - including a chip set for the HomePNA standard and a wiring system for new homes," said Ms Lee.

"My group is looking at a gateway product to enable home users to plug into a cable modem or an ADSL line for high-speed access to the Internet."

Asymmetrical digital subscriber loop (ADSL), which uses existing copper wiring, and cable both offer the greater bandwidth needed for the expected increase in network traffic to the home.

Ms Lee says this opens the door to a range of applications from home monitoring and security to entertainment and combined voice and data communications. More importantly, it offers opportunities for telecommunications suppliers to create new services for residential users.

"The home network is a pot of gold sitting below the surface for suppliers," she adds. "They are racing to bring more bandwidth to the home - through technologies like cable or ADSL. This is essential for delivering services that people will want to use."

If you draw a parallel with the water system, for example, no one would think of installing plumbing to get a few drops of water to the tap.

"But if you can provide it on demand in large quantities, then it starts to make sense. The same goes for home networking."

The digital world and the battle for the eyeballs: see page 21

SOFTWARE SUPPLIER PROFILE: COREL by Geoffrey Wheelwright

Vigorous defence for controversial WordPerfect purchase

Mike Cowpland, head of Corel, says consolidation will significantly reduce research and development costs

A lot of people have told Mike Cowpland that he made a mistake two years ago when he negotiated a deal for his Ottawa-based Corel Corporation to buy the troubled WordPerfect suite of word-processing and office productivity applications from Novell, the network software giant.

WordPerfect had for some time been losing market share to Microsoft Office, while Corel's own CorelDraw graphics software application was one of the few mainstream software products not to run into competition with Microsoft.

Industry observers speculated publicly about whether Corel's chief executive was wise to enter into direct competition with Microsoft by buying WordPerfect, and whether it would survive as a result.

Two years later, Dr Cowpland will admit that it has

not been easy channelling both WordPerfect and CorelDraw. But he steadfastly insists that the WordPerfect acquisition was not a mistake, despite the fact that Corel has been on a financial rollercoaster ride for the past year.

In late September, Corel reported fiscal 1998 third quarter results for the period ended August 31 that seemed to bolster Dr Cowpland's claims. Revenues for the third quarter of 1998 were \$71.1m, up 46 per cent from \$48.8m from the same period in 1997, and up 13 per cent from revenues of \$63m for the second quarter of fiscal 1998.

Corel's Comdex announcement

Last month, at Comdex, the IT industry event in Las Vegas, Corel unveiled a beta

version of its new office suite, WordPerfect Office 2000. The product will include WordPerfect 8, plus a powerful spreadsheet and personal information manager system.

Corel's announcement followed the unveiling by Microsoft of its Office 2000 suite. Despite the anticipation of new revenues from the upcoming version of WordPerfect Office 2000, Corel is still losing money. And its share price had declined from more than \$4 to less than \$2 in mid-October.

Still, there are some signs of progress. Net loss for the third quarter of fiscal 1998 was \$7.6m, or 13 cents a share, compared with a net loss of \$8.5m, or 14 cents a share, for the second quarter of 1998. Part of the loss can be attributed to moves taken by Dr Cowpland to stem the costs of WordPerfect devel-

opment and consolidate it at the company's Canadian headquarters.

Corel recorded a non-recurring restructuring charge



Productivity software: focus on Corel

of \$15.9m, attributable to the consolidation plan, a key element of which was the transfer of research and development from Corel's Utah

engineering centre to facilities in Ottawa. The company says that this consolidation will contribute to a significant reduction in future research and development expenses and claims that future product releases will remain on schedule.

"We feel this is our real turnaround quarter," says Dr Cowpland. "These results show that the steps we have taken during the past three quarters are working."

"We anticipate to return the company to profitability by our fiscal year-end. We believe that our results will continue to improve and are consequently targeting sustainable profitability beginning in the fourth quarter of fiscal 1998."

He rejects the notion that he should have any regrets about buying WordPerfect.

"Although with WordPerfect we have made a few mistakes here and there, it has definitely not been a mistake," he says, suggesting that the recent consoli-

dation of research and development efforts in Ottawa will further remedy Corel's WordPerfect situation.

Increasing market share

"We now positioned to compete in a broad spectrum of applications," he adds.

He also disputes statistics that suggest WordPerfect is losing the battle for market share in the office suites sector.

"We are seeing good resiliency in terms of maintaining and increasing market share and we are settling into a stride where we can co-exist and provide a good alternative to Microsoft," says Dr Cowpland. "We are a good number two with full data compatibility with Microsoft Office and that extra graphics sizzle that Corel is known for [in the current version of WordPerfect]."

He admits, however, that

it is difficult to ride both the CorelDraw and WordPerfect horses at once. "It is a management challenge having two flagships to run, and we are pleased that we are now moving to consolidate into one operation," he adds.

"Before now, it has been difficult to get as much produced as we had hoped. And we will see huge savings - as much as \$10m a quarter. We needed to make sure that the WordPerfect technology would move forward in a seamless way to keep our loyal users."

Dr Cowpland also sees a lot of Internet-related opportunities for Corel. Earlier this year the company launched a new hardware division known as Corel Computer. It sells "Internet and intranet appliances" that run the Linux operating system. The most recent of these is the NetWinder WS, a World Wide Web server that uses the StrongARM RISC processor, comes with 32Mb of Ram, a 3.2 Gigabyte



Dr Cowpland, head of Ottawa-based Corel: "We can co-exist with Microsoft"

hard drive and sells for \$969. Corel Computer promises that users should be able to use this server to quickly set up and begin hosting World Wide Web pages.

Other Internet and intranet-related projects include Corel's iBridge software, which provides a bridge between so-called "thin clients" corporate networks and the Internet and intranet worlds, and a Linux version of WordPerfect.

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THE DIGITAL HOME by Paul Taylor

'Battle for the eyeballs' heats up

More than ever before, intelligence is being embedded in consumer electronic equipment and household white goods

When Intel, the world's largest chipmaker, launched the Pentium MMX microprocessor a few years ago Andy Grove, Intel's former chief executive, described the ensuing battle for the home market as "the battle for the eyeballs".

This has proved a fitting description as global sales of ever more powerful home personal computers have overtaken those of television sets.

The arrival of high power 3-D graphics cards, DVD (Digital Versatile Disc) drives, and multimedia software has also pitched the PC into a direct battle with games consoles and other entertainment devices.

The console market continues to grow, reflecting mainly the success of Sony's PlayStation machine, but the personal computer is now accepted as a viable games platform in its own right and a worthy rival for the dedicated machines built by Nintendo, Sega and Sony.

While the cheapest personal computers still cost four or five times the price

of the world and annual sales are running at around \$5m - means that the PC has become an attractive option for games developers and publishers.

At the same time the astonishing growth of the Internet, the web and online market has turned the home or small office PC into a vital communications tool and, increasingly, a device for conducting electronic commerce.

The most recent research suggests that in households with both PCs and television sets young people in particular are spending more time on the net and using their PCs than watching television.

Home PC buyers are also becoming more demanding. Toon Bouten, Compaq vice-president for consumer products in Europe, says today's PC purchasers want high-end machines at rock bottom prices.

Historically, corporate personal computer buyers bought the biggest and fastest machines. But over the past five years all that has changed. Spurred on by plunging PC prices and the power-hungry hardware requirements of multimedia games and digital imaging, home PC buyers now choose the latest and best machines.

Today, most home PC buyers will select a machine built around Intel's latest generation Celeron or Pentium II microprocessor running at 333MHz or faster, with a large 9GB hard drive, a 32x speed CD-Rom or DVD drive, a 56Kbps modem or an ISDN card and 64MB or 128MB of Ram.

Multimedia computing is more demanding than traditional business computing because it takes millions of times more data to make audio and video come alive on the PC than it does to create business documents and financial tables, notes Intel.

Today's three-dimensional flight simulator and racing games use as much processing power as yesterday's most advanced scientific applications running on exotic, multi-million-dollar supercomputers.

Even an entry level home PC today costing less than \$1,000 from a leading manufacturer such as Compaq Computer, Hewlett-Packard or Packard Bell now has the processing power of a 1970s corporate mainframe.

However, the recent rapid expansion of the sub-\$1,000 market in the US and now in Europe did catch Intel and some PC manufacturers off guard. Rival chip makers,

particularly AMD, managed to grab a sizeable chunk of the home PC market with cut-price microprocessors before Intel responded with its Celeron processor.

As a result, PC buyers face the widest choice of microprocessors to power their machines than for many years. Some are also choosing to purchase Apple Computer's latest machine, the iMac which, aside from a unique design, is intended to be particularly easy to set up and use.

Ease-of-use remains a key issue, particularly for operating system developers such as Microsoft. Tomorrow's PCs are likely to be easier to use and more fun thanks to their greater processing power and technologies like voice activation, digital versatile discs and real-time video processing.

They should also be less frustrating for new users and be capable of self-healing - diagnosing their own problems and finding solutions. This, in turn, is expected to fuel a further expansion of the home PC market.

As the installed base of home PCs grows some families will end up with several machines. In the US, 14m, or

35 per cent of the country's 40m homes with personal computers already have more than one.

As a result Intel and industry analysts are predicting a surge in home networks - PCs hooked up together to share resources such as printers, files and Internet access.

Network equipment manufacturers such as Cisco, 3Com and others are already predicting a boom in home and home office networks. While some of these will be hard wired using network cables, others will use existing power line or telephone cables or wireless links.

These home networks are likely to hook up a wide variety of devices including digital set top boxes. The arrival of digital broadcasting and interactive services will further blur the distinctions between a PC television as a communications and entertainment centre, particularly once digital set-top boxes are equipped with high-bandwidth communications links.

For example, the set-top boxes produced for the launch of digital satellite and digital terrestrial broadcasting services in Britain

over the past two months are powerful personal computers in their own right equipped with smartcard readers and modem connections.

In this new digital world there may also be a place for hybrid PC TVs and so-called web TVs as well as "smart" telephones and other gadgets and "thin client" machines designed to combine the features of a personal computer, electronic organiser and web-enabled communications device.

NCR, the US-based IT systems and data warehousing group, recently caught public attention by demonstrating Microwave bank to illustrate the fact that banking and other services are likely to be delivered into the home using a wide variety of devices and communications routes.

More than ever before, intelligence is being embedded into consumer electronic equipment and household white goods, blurring the distinctions between personal computers and other machines and hastening the arrival of the digital networked home. The battle for our eyeballs may have only just begun.



In the US and Europe, home computers, desktop colour printers and colour scanners are bringing the magic of photography to amateurs of all ages. As the installed base of home PCs grows, some families will end up with several machines. In the US, 14m, or 35 per cent, of the country's 40m homes with PCs already have more than one.

An entry level home PC costing less than \$1,000 from a leading manufacturer now has the processing power of a 1970s mainframe

of video games consoles and are more difficult to use, the widespread deployment of CD-Rom drives within PCs has helped to fuel a surge in PC-based video games.

Rapid advances in both computing power and three-dimensional graphics capabilities have turned the general purpose personal computer into a solid games machine and a worthy rival for dedicated consoles despite the insistence of games aficionados that consoles are still best.

This reputation has been enhanced by the success of PC games such as Doom and Tomb Raider, the hugely successful adventure game starring a well-endowed female character called Lara Croft.

Indeed, the huge installed base of personal computers - there are an estimated 250m personal computers in

OCTOPUS IN HONG KONG

Ahead of schedule

From page 19:

JM & Co's Manila operation took up the challenge, it decided to abandon aspects of the work that had been done.

"We did look at the software designs, but they had been done to a method we could re-use," says Vivian Miners, executive director of the company's Global Development Centre in Manila.

The recycling of computer code is key to the JM & Co way of working. Work on finance contracts for Jardine Group provided bricks of software that could be slotted into a transport project.

The world of object-oriented software, where code is written to relate to specific objects in the real world so it can be re-applied when those objects are involved in another program, was the key to this job. "In JM & Co, people have become used to working like this," says Mr Miners. "They like to plug and play with software the way some people switch between hardware items."

"We re-applied about 60 per cent of the software from our library of other projects. This has given us an assembly line of proven code, employing reusable objects. Around 40 per cent of the software was written as new."

Paul Smith, ERG general manager on Octopus, explains that as Hong Kong commuters load up the Octopus card from metro stations, they deposit a huge amount of cash.

Thus the key to managing Octopus was to realise that the transport authority was effectively becoming a bank. Since cost estimates had

doubled for the project, further slippage could not be tolerated.

Using JM & Co as a manager for the software project, Mr Smith established set deadlines for practical achievements, adding functions to Octopus as they were proven by a rigorous testing regime.

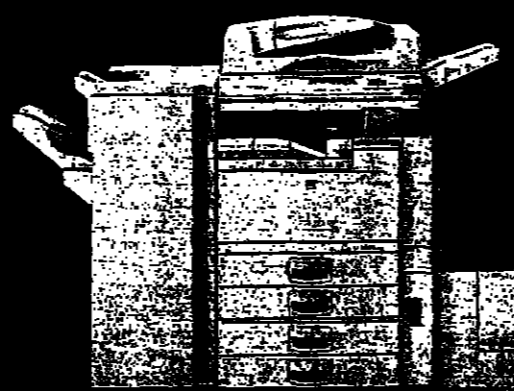
"We had to deliver," he says. "As dates for each function - such as so many gates working with the smartcard - were met, the other sub-contractors were free to get on with their jobs in parallel with ERG and JM & Co."

Octopus had to support six different transit operators using railways, metro lines, buses and ferries, making this the first smartcard fare system to be integrated across completely different methods of transport. It needed to perform 4m transactions in a six-hour period.

The Manila operation of JM & Co wrote the Octopus software, a team in Hong Kong installed it and a third independent team was responsible for verification. Sun Computers and Oracle were among 17 different suppliers to be managed within the JM & Co cycle of development and testing.

The system was delivered three days ahead of schedule, on June 27, 1997, and had 1.5m users on the first day. Now, HK\$23m (US\$3m) passes through Octopus every day, with more than 8m cards in circulation.

Octopus cards can be used at public telephones and further applications of the core system are under test. Today, there are 10m Octopus cards in circulation in Hong Kong.



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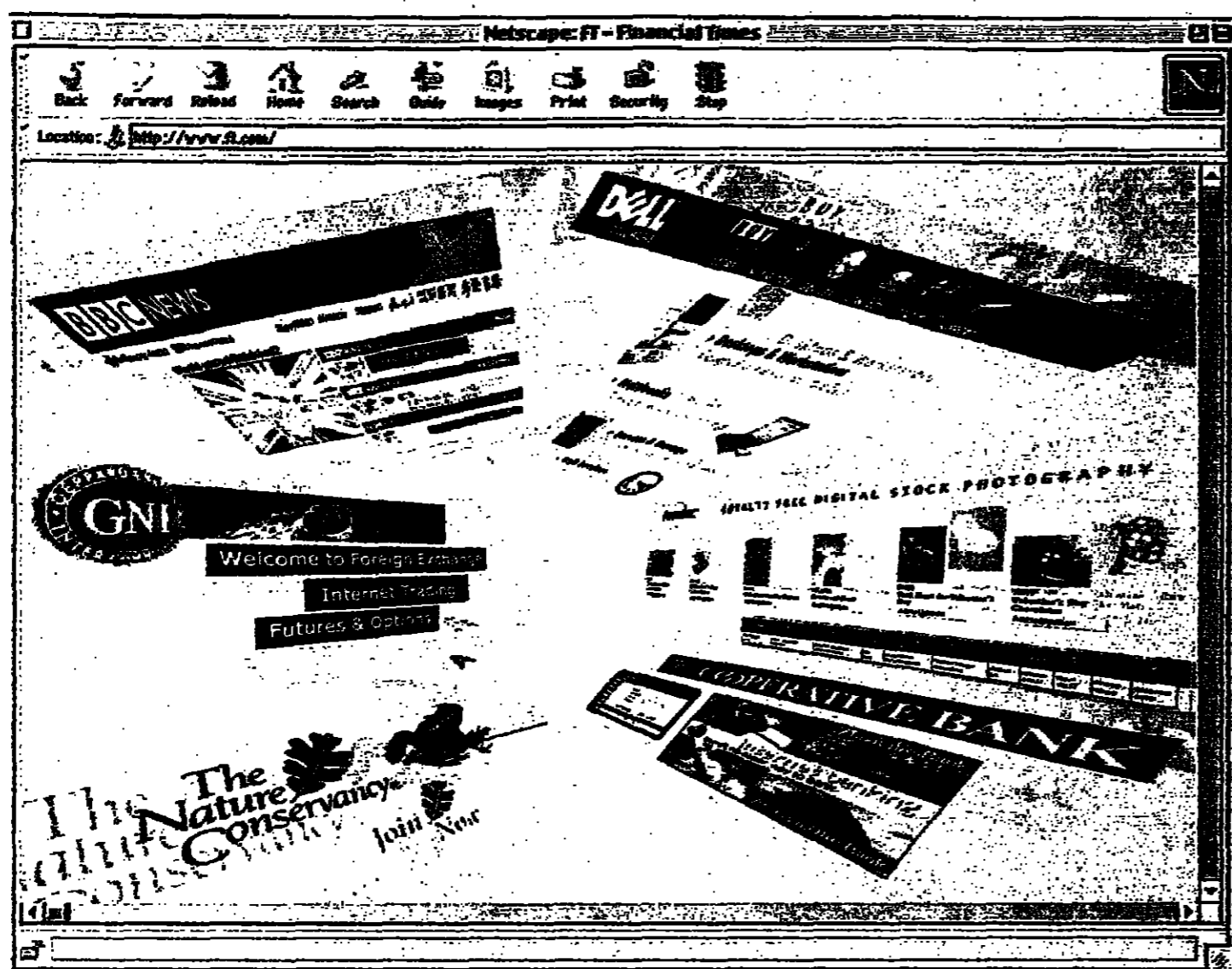
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FT BUSINESS WEB SITES OF 1998 - in association with UUNET

Winning web sites

From a record number of entries, the category winners for the FT Business Web Site of the Year awards were announced in London this week

Some of the world's top web sites were honoured this week at the awards presentation for the competition to find the FT Business Web Site of 1998. Sue MacGregor, the BBC radio and television personality, presented the awards.

The competition, in its second year, is sponsored by UUNET, an MCI WorldCom company and leader in Internet communications solutions, in partnership with the FT. More than 120 companies entered the competition, a big rise from last year.

The competition differs from other web events by focussing on business benefits. Judges assess how organisations use their sites to achieve commercial advantage.

The judges were from UUNET - Richard Hayes, UK managing director, Denise Fellows, product and solutions director, Henry Ritson, web specialist and international marketing communications manager, from the Financial Times - Paul Malmgren, editor of FT.com, and Paul Taylor, IT Correspondent.

The entries were divided into sectors ranging from large organisations to small enterprises and including the public sector. The judges again found it necessary to select more than one winner in some categories and more than one highly commended to reflect the high quality of entries.

They also introduced a new category, Sites to Watch, to recognise web sites which were especially innovative.

Winners and finalists in each category were as follows:

Large corporates

□ Winner: Dell, Europe
<http://www.dell.co.uk>
Dell's European web sites were among the first to be online business-enabled and now conduct over \$5m of sales per week.

Customers can review, configure and price systems within Dell's entire product line, order systems

online or by telephone, and track orders from manufacturing through shipping. The site also offers personalised system-support pages and more than 45,000 technical service items.

□ Highly commended: Cellnet - <http://www.genie.co.uk>
Genie is a service unique to Cellnet which delivers tailored news and information direct to Cellnet digital phones or an e-mail address from the Genie web site.

It has four clear strategies: business - to stimulate more calls; marketing - to develop a direct relationship with the end customer; technical - to provide best practice functionality to mobile users; and creative - to create a web product

A series of case studies featuring these winning web sites will appear in the monthly FT-IT Review next year

with leading edge design.

□ Highly commended: Eastman Kodak - <http://www.kodak.com>
This focusses on ways of making people excited about the power of pictures, while at the same time building the brand and strengthening market share.

□ Highly commended: RS Components - <http://www.rscomponents.com>
This site provides seamless integration into existing order processing and same day despatch of 100,000 stock items.

Finance Sector

□ Joint winners: GNI and the Co-operative Bank
□ GNI: <http://www.gni.co.uk>
The site was established to provide

data on GNI's broking services in global derivatives markets and to distribute research.

The site has revolutionised GNI's marketing. The demand for access to GNI's research, and the number of users downloading the FX Internet Trading system - complete with live FX prices fed to the user from major global banks - has been extremely high.

□ The Co-operative Bank: <http://www.co-operativebank.co.uk>
The Co-operative Bank's online banking service was designed by Entrant. Available free to existing and new customers, the Internet banking service was used by more than 12,000 customers in its first six weeks for 250,000 transactions from 20 countries.

□ Highly commended: ICICI Bank - <http://www.icicibank.com>
Back for the second year is the ICICI Bank's web site. It was initially targeted at a well defined, but hard to reach, segment of customers - non-resident Indians.

When Internet usage picked up in India, the focus was expanded to include resident Indians. Early this year, Infinity - the Internet Banking service - was introduced.

Small to Medium Enterprises

□ Winner: Photodisc Europe
<http://www.photodisc.com>
The first PhotoDisc site was a marketing only presence. It was designed to promote photographers' images to a world-wide audience of target customers, namely graphics and communications professionals. The site allows customers to search quickly and efficiently through over 60,000 images and purchase and download those they need.

□ Highly commended: Ministry of Sound - <http://www.ministryofsound.co.uk>
This site claims now to be the world's best club web site.

□ Highly commended: Seant

- <http://www.seant.co.uk>
Back for the second year, Seant serves the needs of the international maritime community by combining information provision, a trading area and a secure e-mail system.

Public Sector

□ Winner: BBC News Online - <http://www.news.bbc.co.uk>
BBC News Online was launched in November 1997. It was created as part of a BBC-wide strategy that targets the web as the third broadcast medium and one that will expand rapidly.

□ Highly commended: Foreign and Commonwealth Office - <http://www.fco.gov.uk>
Since there are 220 diplomatic posts representing Britain across the world, this site has a global remit. The site provides up-to-date news for those abroad and allows instant access to the FCO's standpoint on foreign countries.

□ Highly commended: The Army Recruiting Group - <http://www.army.mod.uk/armyrecruit>
The British Army World Challenge, a series of interactive scenarios leading to an online application facility, was launched to complement the army's above-the-line campaign.

Not for profit

□ Winner: The Nature Conservancy - <http://www.tnc.org>
The basic goals for this site are: to raise awareness of the organisation; to use technology to create content that would raise funds for land acquisition programmes; and to create a central information resource about the organisation.

Sites to watch

□ Joint winners: Road Tech Computer Systems and TIMBERWeb
□ Road Tech Computer Systems: <http://www.roadrunner.co.uk>
An estimated 35 per cent of all haulage on the road is empty. Roadrunner aims to fill up these empty vehicles through its web site.

□ TIMBERWeb: <http://www.timberweb.co.uk>
TIMBERWeb is a focus for the world timber and forest products industries. Companies subscribe via business card entries which list vital company information.

LOOKING AHEAD

FT REVIEW OF INFORMATION TECHNOLOGY

A fresh focus on IT in finance and e-commerce in 1999

Special features planned for next year's FT Review of Information Technology will highlight the rapid shift towards Internet-related business opportunities

The shape of things to come is the key theme in the next issue of the FT-IT Review on January 6, 1999. This futuristic issue will examine the likely impact of IT in a wide range of business sectors in the next decade.

From February onwards, the review, which is published on the first Wednesday of each month, will carry regular features on:

- IT in finance, with a special focus each month.
- Electronic business
- The millennium date issue and euro compliance.
- IT news update.

Each issue will include a main theme, with a cover story on a topic of key importance to IT users, plus views of leading suppliers in the IT industry.

During the year, there will also be a series of mid-month reviews on business solutions, highlighting enterprise resource planning, managed services and knowledge management systems.

February

- Main theme: IT and the Customer (Customer Relationship Management, CRM).
- Second theme: Green computing.
- Plus regular features including: IT in finance - focus on broking; electronic business; update on the millennium date issue; and the race for euro compliance.

March

- This month the world's largest IT show takes place in Hannover, Germany, and our main theme will be: the IT industry in transition.
- Second theme: IT and New Media.
- Plus regular features including: IT in finance - focus on the European Central Bank; electronic business; update on the millennium date issue; and the race for euro compliance.

April

- Main theme: Electronic commerce and the wired business.
- Second theme: Java update.
- Plus regular features including: IT in finance - focus on insurance; electronic business; update on the millennium date issue; and the race for euro compliance.

May

- Main theme: Mid-sized enterprises: selecting an IT

focus on investment banking; electronic business; update on the millennium date issue; and the race for euro compliance.

November

- Main theme: Continuity Planning (II).
- Second theme: IT in Travel and Leisure.
- Plus regular features including: IT in finance - focus on fund management; e-business; the millennium date issue; and euro compliance.

December

- Main theme: The Cyber Millennium.
- Second theme: IT in the search for the stars.

Special mid-month series on business solutions

During the year, we plan to include a series of special issues:

- Business solutions: Enterprise Resource Planning.
- Business solutions: Managed services and outsourcing - a \$55bn market.
- Business solutions: Knowledge Management.

For more details

□ During the year, our editorial fax-back service will give detailed synopses, two months in advance of each issue. Callers in the UK should dial 0990 209 903; fax machines should be in polling mode. Callers outside the UK should dial +44 990 209 903.

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September

- Main theme: IT in Retailing.
- Second theme: Supply Chain Management.
- Plus regular features including: IT in finance - focus on risk management; electronic business; update on the millennium date issue; and euro compliance.

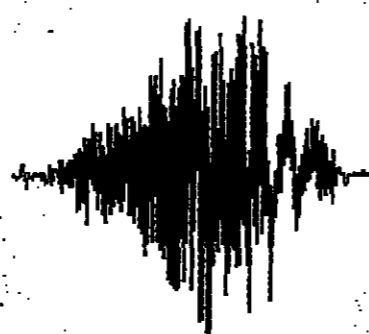
October

- Main theme: Continuity planning in the aftermath of the millennium "bomb".
- Second theme: IT in Education.
- Plus regular features including: IT in finance -

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